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35MM ISSUE!



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LENS VS. FILM DESIGNERS:
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FOR SUPERB QUALITY IN
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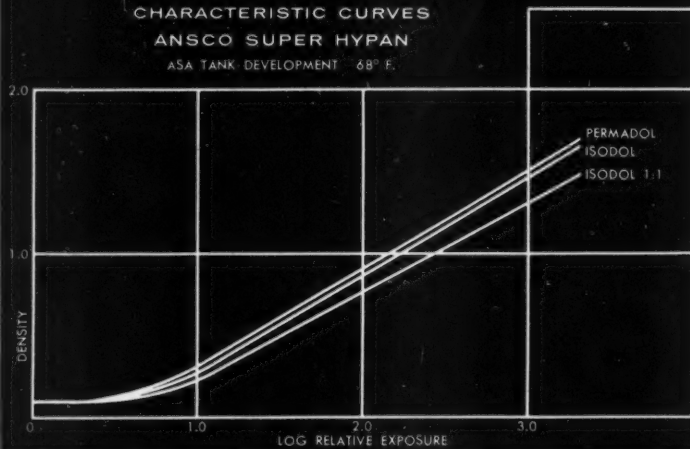
300 LENSES IN THE
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CHARACTERISTIC CURVES

ANSCO SUPER HYPAN

ASA TANK DEVELOPMENT 68° F.



some plain talk about modern emulsion technology

Films are very different today than they were just a few years ago. (As if you haven't noticed!)

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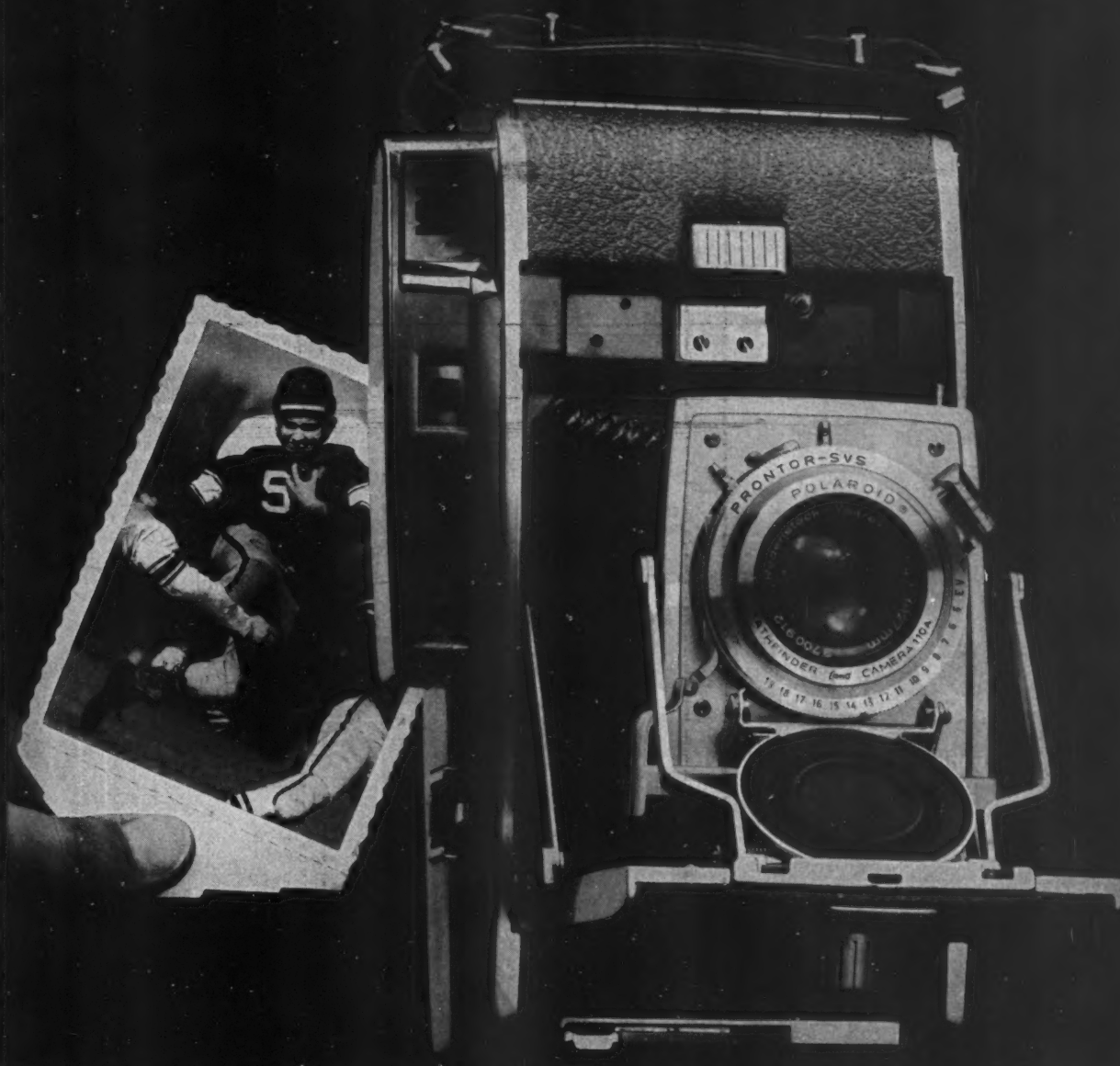
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OCTOBER, 1958

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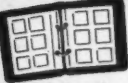
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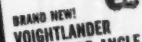
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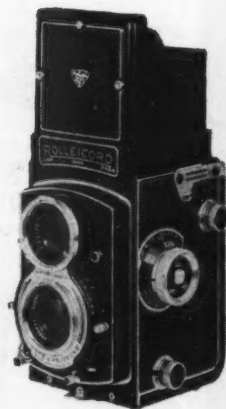
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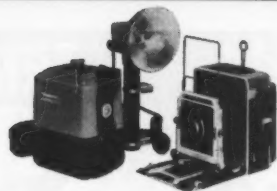
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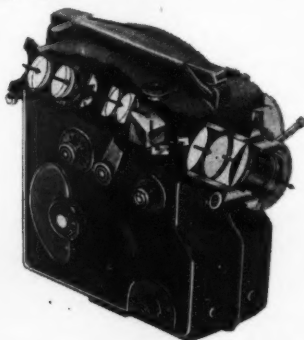
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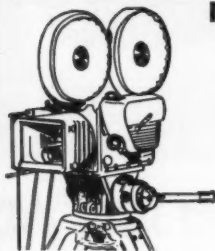
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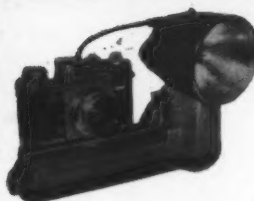
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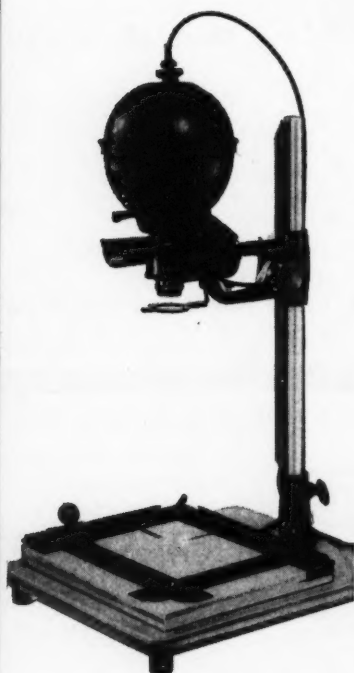
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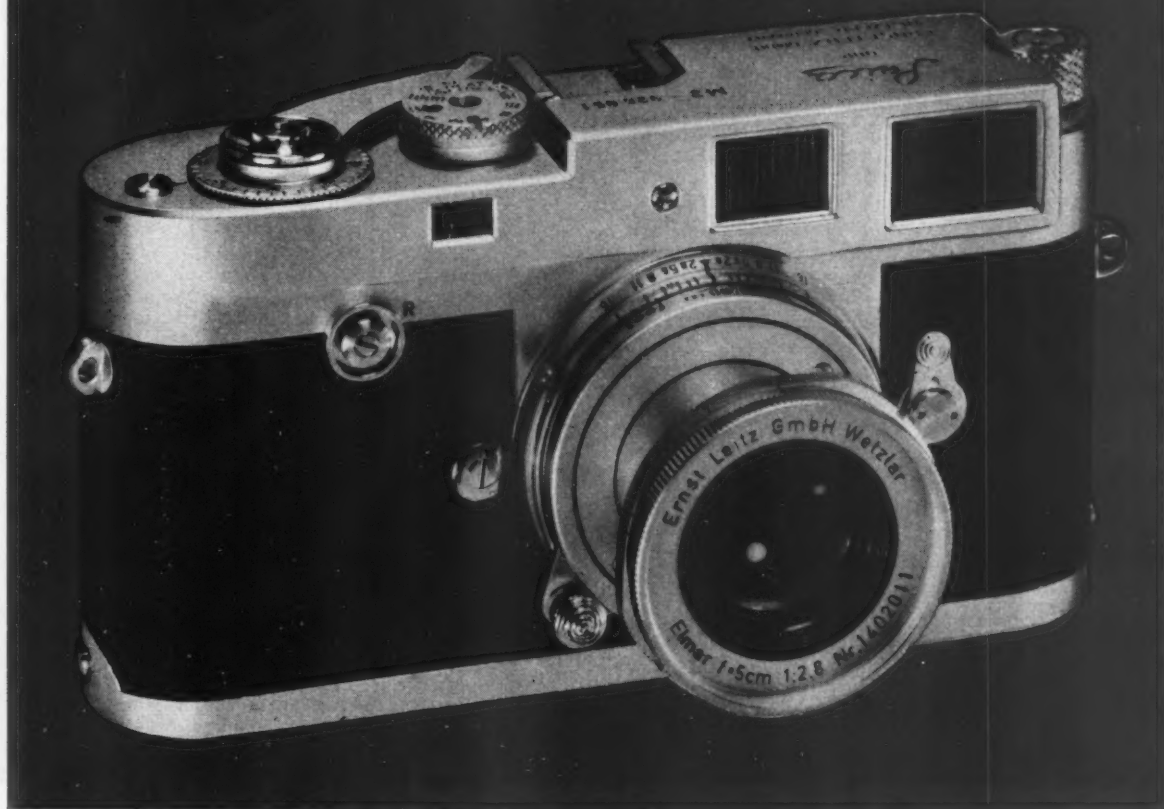
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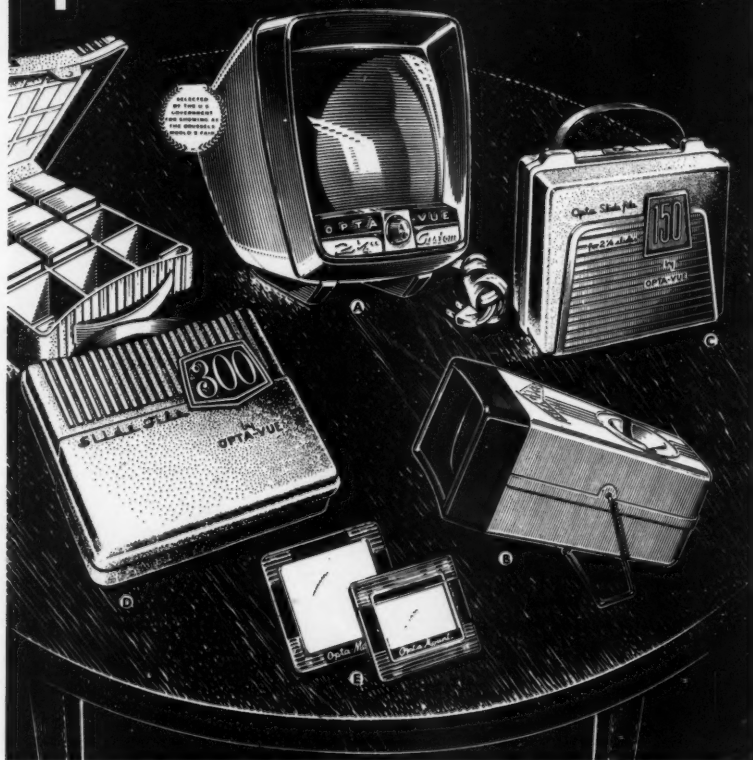
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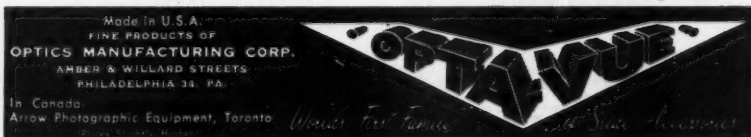
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Coffee Break

WITH THE EDITORS

THIS MONTH'S COVER . . .

Sharp-eyed readers will already have recognized Millie "Anne Frank" Perkins on our cover again this month. Photographer: Hal Reiff.

Jacquelyn Balish shot Marilyn Monroe riding a circus elephant with a Nikon S and 85mm f/1.5 Nikkor lens. Daylight Ektachrome film under tungsten circus lights produced the surrealistic pink color cast. Exposure was f/1.5 and 1/30 sec.

The vivid close-up of a hot-house flower as made by Michael Abandoni, who used a Leica M3 with Visoflex and bellows and 135mm Hektor lens. Kodachrome Daylight was exposed at f/32 for 12 seconds (using a tripod, naturally). A slight breeze made long exposures difficult, but persistence recorded a few in which no petal stirred.

BIRD IN HAND . . .

M/Sgt. Norman Zeisloft says it's true, and sent pictures along to prove it. Homing pigeons, as every serious-minded spy mystery fan knows, are the feathered couriers of secret messages (in code) which invariably save the day for the home team. Now comes word that they're carrying film, too!

Sgt. Zeisloft, an American press photographer stationed with the Air Force in Japan, discovered this top



NORMAN ZEISLOFT

Standard equipment

secret information when he was shooting a picture story on the average Japanese press photographer. It seems that Kinji Yamamoto, photographer (Continued on page 14)



The camera that comes to life in your hands: NIKON SP

Owning a Nikon SP is like having the magic key to creative photography. From the moment it is in your hands, it comes to life—responsive—working with you to achieve the finest possible results. It is the perfect marriage of mechanical precision and optical performance.

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Then the crowning achievement: the built-in Universal Viewfinder System, probably the most remarkable and useful single feature ever introduced to a 35mm camera. This finder system makes it possible to interchange and use any of 6 different focal lengths lenses without the need for accessory finders. And it covers 28, 35, 50, 85, 105 and 135mm lenses, the latter four with automatic parallax compensation.

Apart from the convenience of a built-in 6 lens finder, the Universal Viewfinder System helps you select the "right" lens for

the subject—lets you preview the subject as it will appear with any of the six lenses. You select the lens faster, and put it to use faster. With the Nikon SP you can, for the first time, realize the full potential of interchangeable lenses.

And as for the optics, the inherent quality of Nikkor lenses—the rare combination of high speed and high resolution—has yet to be equalled. There are now 16 of these superb Nikkor lenses to choose from.

The list of Nikon SP features is long and impressive. Each adds to the realization that the SP is truly the most modern 35mm camera of our times. But more impressive, and certainly more important, is the way that these features respond, and work for you, for better pictures.

Nikon SP with Universal Viewfinder System: with 50mm Nikkor f/2 \$369.50; with f/1.4 \$415. Nikon S-3 (to the right) with Trifocal Finder—for 35, 50, and 105mm lenses—identical to SP except for finder: with 50mm f/2 \$309.50; with 50mm f/1.4 \$355.



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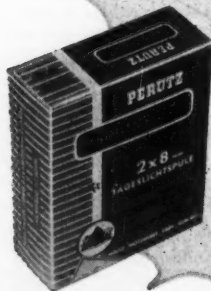
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COFFEE BREAK

(Continued from page 12)

for Japan's leading newspaper, *Mainichi* (page 12), needs more than a Speed Graphic and a gadget bag to cover his assignments. In addition he carries a three-foot step ladder (to keep his head, and his camera, above crowd level)—and a cage of speedy homing pigeons.

It's when news breaks in a remote area that the trusty homers go to work. Since roads in the back country of Japan are so bad (Sgt. Zeisloft assures us), pigeons offer the best film delivery service—making in an hour-and-a-half an air-borne run to the home processing lab that would take a ground traveler eight hours or more.

Each bird carries one piece of film rolled into a tiny plastic tube. After the tube is secured to the pigeon's back with ordinary rubber bands, it's off in a flash of feathers, toting a burden equivalent to an 80-lb. pack for a man.

It cheers us to know that progress has not outmoded a romantic old tradition which we feared had gone out of style with World War I and silent pictures. However, the pigeon's working days may be numbered, after all. *Mainichi's* big rooftop pigeon coop is right next to its helicopter deck!

P.S. Sgt. Norman Zeisloft has recently taken to the air himself—via radio's Far East Network. Featured on a new program, "Get the Picture," he answers the photographic questions of Far East shutterbugs.

WHEN IN A JAM, USE BULB . . .

We recently attended the wedding of MODERN Assistant Editor Ed Meyers to Marcia Rothman. Of course we dutifully took a small folding 35mm camera, loaded our wedding-going suit pockets with the new Plus-X and set out. We reasoned: with our tiny 35mm camera and natural light we could



HERBERT KEPPLER

Accidental genius

take far, far more exciting, more interesting, more natural pictures than the traditional wedding photographer with his 4 x 5 flash-on-camera hired to make the album pictures.

On the first shot, our camera's shutter jammed and there we were in Philadelphia on a Sunday morning with a broken camera and not a repair shop in sight.

We borrowed a Konica II from a resourceful brother of the bride who had thoughtfully come to the wedding with

two cameras—both working properly.

Handling a strange camera under poor lighting conditions using a yet-to-be tested film is not considered good photographic practice. However, we pitched into our work with the appropriate enthusiasm, but lost some of it when we discovered that one roll of film we had hoped would turn out to be prize pictures was shot at the "B" shutter setting—instead of 1/25 sec. We corrected the speed and finished in what we felt was grand style.

The pictures were very successful—but, the shots made at "B" with their



HERBERT KEPPLER

The right setting

wild blurry movement caused the most enthusiasm among various staff members. Genius, said they. Oh, said we, nothing to it at all. Do it every time.

NOTABLE . . .

The recent second annual Photojournalism Conference at the University of Miami produced some notable quotes from leading editors and photographers:

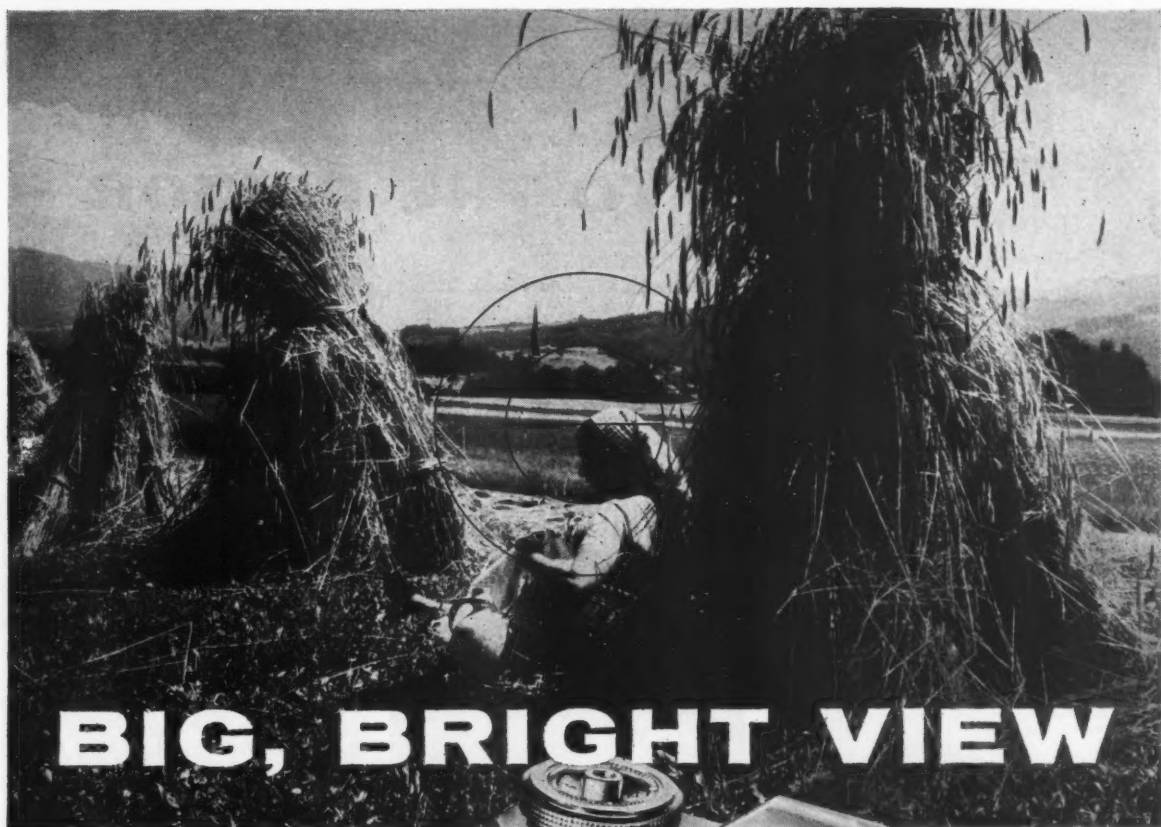
The photographer "must become so technically proficient that he thinks with both heart and camera . . . photography has to come from the heart. It is highly personal," said Margaret Bourke-White, staff photographer of *Life*, in the keynote speech.

Norton Wood, Associate Editor of *Sports Illustrated*: "If pictures aren't simply more than statements of fact, they aren't worth publishing."

Jess Gorkin, Editor of *Parade*: "Most free lancers don't realize the philosophy of the magazine they want to work for. Take, for example, a story about women. *Life* would probably do a significance story of women around the world, *Look* would take a typical woman—the girl next door, *Redbook* would run 'How Women Will Fail Their Men,' *The Ladies Home Journal* would run 'How America Lives With Its Women' and *Pageant* would run 'How Pregnant are U. S. Women?'"

David Linton, ASMP president, on the definition of photojournalism: "... a special and unique kind of reporting . . . the ability to search out from all the moments of time that instant which has more meaning than any other."

The four-day conference was attended by 180 photographers, editors and writers, which included representatives from Panama and Sweden as well as the U. S.



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LETTERS TO THE EDITOR

Experienced

Sirs:

In the past I did not have too much photographic experience, but now I am getting a little better on that subject. I am 12 years old.

In short, I want to give you a few data on how I made a picture of my cat playing the piano. I have practiced until I could get my cat to catch a string. The string is in back of the piano that you see him playing. My



brother was in back of him pulling the string up and down until he tried to catch it. And that gives the impression of the cat playing a piano.

The name of my camera is Photina Reflex. The film was Tri-X, and the exposure was by two photoflood lamps at 1/100 second.

New York, N. Y. Jerry Weissmann

P.S. I will be very happy to send you more pictures that I have made (generally of cats).

• We look forward to it.—Ed.

First Things First

Sirs:

MODERN PHOTOGRAPHY is keyed to the nth power of photographic perfection. Only skilled experts can decipher its contents. The apparent reason is that your clientele is composed of users of only high grade cameras and equipment. Your advertiser patrons cater to these sputnickian squinters.

Here's the quintessence of this epistle: Have one whole page keyed to the needs of all camera clickers who rate below professionalism. Tell 'em of the beginners' mistakes and how not to make 'em. Then gently lead them along from first-year Latin to Caesar. At this point, your class will be ready to understand the fundamentals of "modern photography."

Intercession City, Fla. Oscar Raisor

Sad State

Sirs:

It was a great pleasure to read John Wolbarst's article on 35mm quality, i.e. the American version as opposed

to the German version of quality.

... I blame the editors of our magazines. I feel that they set too low a standard and are satisfied with poor reproduction.

There is one serious deficiency in American photo magazines and that is that there is rarely, if ever, any constructive criticism of composition. There is a total lack of any artistic appreciation of photography. Nothing but "impact," whatever that is. I am sure that you have noticed that the majority of German photographers have served an apprenticeship and also attended a regular photographic school, and furthermore passed a properly set examination. It is not a matter of paying your way through and getting a certificate at the end of a course. The Germans set a high standard and I don't think there is any way under the fence. The American way is that if you can pay you can pass.

Fairhaven, Mass. William Mullen

• Mr. Mullen's letter and those which follow refer to John Wolbarst's "35MM" column in the May issue of MODERN PHOTOGRAPHY, which was devoted to "the sad state of 35mm black-and-white picture quality in the U.S.A. today."—Ed.

Sirs:

Who have you heard of these days that is famous for making violins? This is serious—I mean to say that there are no real craftsmen around much anymore. The last one passed with Edward Weston, in my mind. Very seldom is there now anyone who is experimenting to get better quality. Rome, N. Y. Charles A. Chrestien

Sirs:

My hat is off to you for the very excellent article on the state of 35mm black-and-white photography in this country.

It is probably the most outspoken and boldest attack on the slipshod methods of a large majority of photographers ever published in a magazine of such large circulation.

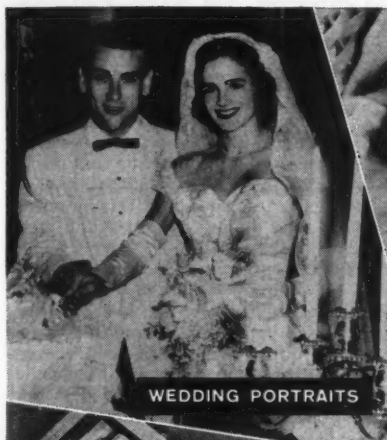
Kurt W. Luhn
New York, N. Y. Kling Photo Corp.

Sirs:

Your article in the May issue of MODERN PHOTOGRAPHY will probably bring you much correspondence.

The trouble is, most American photographers have lost the art of doing something for the pure joy of doing it.

(Continued on page 18)



WEDDING PORTRAITS



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PHOTO-JOURNALISM



SPOT NEWS

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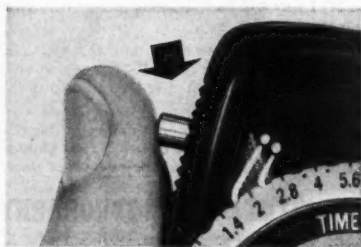
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LETTERS TO THE EDITOR

(Continued from page 16)

If a print is made for the sheer pleasure of making it, only to be viewed by a few loved ones, it is often a beautiful one. (I am thinking here of the serious printer.) It is my conviction that many photographic masterpieces have been produced, and forgotten, by photographers who simply do not want publicity, or payment. However, I think these artists would welcome the chance to look at the work of other keen workers who view their hobby in the same way as they do themselves.

The object of the New England Leica Postal Portfolios is to welcome within itself the Leica photographer who does excellent work for the sheer pleasure of doing it. Other than the personal obligation of producing the finest work he can, the only thing required of the Circle member is that he constructively criticize the prints of other members. The prints in the NELPP are well worth looking at. I should know, I am one of the type of European photographers your article mentions.

If you can find space to mention the NELPP, you will be doing a service for those who continue to practice pure photography in the face of the temptations you cite. The secretary of the Circle One NELPP is Richard Munroe, 52 Forest Street, Lexington, Mass. Photographers interested in the details of membership should write directly to him.

Carlisle, Mass.

Edwin Dunn

Sirs:

AMEN! It has taken too long for such an article to appear. I have become sick and tired of purchasing photography magazines which go to great lengths to insist that photographers MUST employ only the absolute finest of techniques if they wish to have their work published. Yet the illustrations in every one of those same magazines give the lie to their preaching.

Irwin, Pa.

James B. Brook

Sirs:

It seems to me that starting about the time Floyd Gibbons, war correspondent, began his staccato or machinegun fire method of broadcasting news via radio, we Americans have been in one helluva hurry to finish any and everything we set out to do. Everything today seems to have to have a "deadline." This is true of newspapers or baking a cake, and from the quantities of pictures I have seen it would appear to be true of photographs, a great number of which are just record shots. A good record shot today that has "impact" (whatever that is supposed to imply) is apparently preferred to a fine all around piece of workmanship.

I still feel black-and-white photography is a good medium to try to express a mood with.

Hartford, Conn.

Arthur F. Newton

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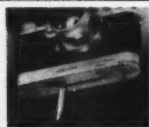
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The new Pan Cinor 30 Direct View Zoom lens now offers all the features for your 8mm camera that up to now were only available for 16mm. Direct viewing through the lens, no parallax problem. Zooming range 10 to 30mm (wide angle to telephoto.) The Pan Cinor 300.V. fits all standard mount 8mm cameras. Complete \$189.50.



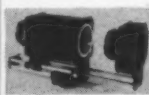
The best way to produce professional fades is the variable shutter. The Bolex 8-8 VS is the only 8mm camera with variable shutter. It gives you depth of field control, complete fades, no wipe or change of color rendition. Complete with f2.5 Kern lens only \$134.50.



You may trade your present camera for the Bolex with the variable shutter. You can operate your Bolex H8 or H16 by electric motor using battery, or plug in. Simply attach the Bolex Unimotor to the camera and run an entire 100' roll through, at various speeds. Price of the Unimotor only \$77.50.

FRANCHISED BY BOLEX

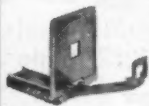
DO YOU KNOW?



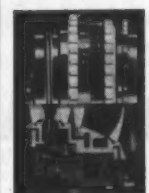
The bellows extension system allows you to make extreme close-ups with your Hasselblad and its normal lens. Ideal for Medical and Dental Photography, copying and reproduction of small objects. Price of complete outfit \$115.50.



The cut film adapter, available for all models, allows you to use single cut-film holders for individual shots. Price of adapter \$18.80. Cut film holders \$7.50.



The Hasselblad Sportsfinder for 1000F is equipped with masks for all accessory lenses, also synchronized for flash and strobe. A useful accessory for action pictures and rapid sequences at only \$19.50. Sportsfinder for Model 500C \$13.25.



The Zeiss Distagon 60mm f5.6 wide angle lens increases the image angle to 65°. This 6 element lens has a high resolving power with edge-to-edge sharpness, fully color corrected. Useful to take in a large picture area in a limited space. Price for Model 1000F \$189.50. The Distagon for Model 500C with built in synchro compur EVS scale and automatic pre-set diaphragm \$312.50.



The "Ever-ready" case is especially designed for rapid operation. Openings for film counter and shutter indicators allow the use of camera without removing it; holds camera securely when case is open. Price for Model 1000F \$28.00, for Model 500C only \$21.50.

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There is nothing like a... *Leica*

Dear Mr. Leica;

- ☐ I WANT TO KNOW...
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CITY.....

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Dear Mr. Hassel;

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SNAP IT UP! SNAP IT IN!



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DeLuxe Snap-in Mounts
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SWIFTER: **5**
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Just insert and lock!

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Positive snap-in lock prevents LINDIAS coming apart and jamming projector, but...

SMARTER...
LINDIAS can easily be re-opened and re-used — ANY TIME!

Box of 20 \$ 2.75
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NEW products

Graflex Film Strip Projectors

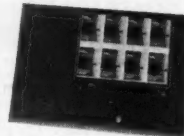


Two Graflex School Master slide projectors feature 500 and 750-watt Sylvania Tru-Focus lamps respectively, and can be used for both film strips and regular 2 x 2 slide projection.

Both machines have Bausch & Lomb 5-in. f/3.5 projection lenses. Other features include: Single slot film channel, making it possible to thread the projector in only one way; dual control that allows advancing film from either side; aluminum cast construction; and a Handi-Handle for carrying the projector from room to room. Prices are: School Master 500, \$84.50; School Master 750, \$99.50. Write:

GRAFLEX, INC.
DEPT. 106, 3750 MONROE AVE.,
ROCHESTER, N. Y.

Saunders Duplicating Easel



The Saunders Automatic Color-print Duplicating Easel is specially designed for Kodak Ektacolor, Ektachrome and Ansco Printon color print papers.

The easel has a series of masks for making various combinations of multiple prints on one sheet of paper: one 8 x 10, four 3½ x 5, four 4 x 5, or eight 2½ x 3½. The only moving part is a paper carrier that positions the section of the print paper to be exposed to the enlarger light. The easel also can be used for making exposure tests quickly. It can be used with manual or automatic focusing enlargers. Price of the Ektacolor paper outfit is \$67.50. Write:

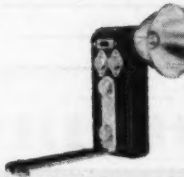
THE SAUNDERS CO.
P.O. BOX 111, ROCHESTER, N. Y.

Kodak Film Cleaner

A new Kodak movie film cleaner removes dirt and at the same time adds a lubricant to your movie films. It is said to eliminate the stickiness which causes unsteady picture image when the film passes through the projector gate, and sound distortion when the track goes over the sound head. The new cleaner may be used on films striped with Kodak Sonotrack Coating (magnetic striping) without harm to the sound track. Price of a 4-oz. bottle of Kodak Film Cleaner is 90¢. Write:

EASTMAN KODAK CO.
ROCHESTER, N. Y.

Tiny Hershey Electronic Flash

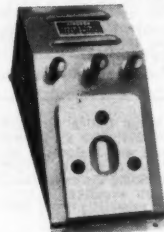


The 2-lb. transistorized Hershey Model 1000 electronic flash has a Kodachrome guide number between 25 and 35 and a flash duration of 1/1800 sec. The nickel cadmium battery may be charged over and over again. A full charge provides 200 to 300 flashes and takes 12 hours. However, sufficient

charge for 20 flashes takes only an hour. The unit has built-in AC operation and may be recharged without adapters. Recycling time is from 8 to 10 sec. Price of the Model 1000, including nickel cadmium battery and AC power cord, is \$79.95. Write:

HERSHEY MFG. CO.
4309 W. LAKE ST., CHICAGO, ILL.

Foot Switch Has Built-in Timer



Each time you step on the Kingdon Audible Timer foot switch a built-in timer goes into action, clicking clearly at one second intervals. A neon light in the center of the foot pedal acts as a guide to locating the foot switch on your darkroom floor. Both enlarger

and safelight may be plugged into the foot switch. Step on the pedal and the safelight goes out as the enlarger goes on. Both enlarger and safelight may be left on if you choose. A black button also allows safelight and enlarger to remain on for long periods of time without continuously pressing foot pedal. Price of the Kingdon Audible Timer foot switch is \$34.95. Write:

KINGDON PHOTO ACCESSORIES CO., INC.
1200 MADISON AVE., NEW YORK 28, N. Y.

Barlights for Miniature Lamps

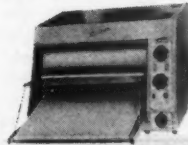


The Harwood Electronics Co. has two barlights designed for the new miniature 375-watt photo-flood lamps. Model 536 is a two-light

unit with a 10-in. bar. Model 536 mounts four lamps on a 17-in. bar. Both units come with metal case holding bar, lights and handle. The four-light unit also has a swivel bracket for the camera, making it easy to place a camera with a front shutter release behind the lamps for more convenient operation. Both bars are controlled by toggle switches. Prices are: two-light unit, \$7.95; four-light unit, \$10.05. Write:

HARWOOD ELECTRONICS CO.
466 W. SUPERIOR ST., CHICAGO 10, ILL.

Improved Beseler Print Dryer



The Beseler Model 1217K is an improved version of the Model 1217 film dryer. The new features include a Terminal

Timer and a Safety Interlock. The timer allows continued rotation of the dryer drum for up to 30 minutes after the heat is turned off for more efficient cooling. The interlock prevents the dryer drum mechanism from operating unless the dryer apron is fully extended. Other features of the 1217K are: dries prints up to 16 in. wide, handles 50 to 60 single-weight glossy 8 x 10 prints per hour, direct motor drive, needle bearings, variable drum speed and thermostatically con-

(Continued on page 22)

Partial List of ALPA Dealers

ALASKA

Mac's Foto Service, 315 4th Ave., Anchorage
Co-op Photo Shop, 535 Second Ave., Fairbanks

ARIZONA

Bill Cook's Camera, 38 Pima Plaza, Scottsdale
Nu-Art Photo Service, 17 E. Pennington, Tucson

CALIFORNIA

Towne Photo Supply, 1809 10th St., Bakersfield
Darnall, 17642 S. Clark Ave., Bellflower
Elmwood Camera, 2999 College Ave., Berkeley
Camera Supply, 1112 Pine, Long Beach
Henry's Camera, 701 West 8th, Los Angeles
Sid Klein, Inc., 7916 Beverly Blvd., Los Angeles
The Family Camera, 1732 Miramonte, Mountain View
Alvina Photographic, 914 East California, Pasadena
Burkhardt Photo, 504 North Main Street, Porterville
Bunnell Photo Shop, 1033 6th St., San Diego
Brooks Camera, 45 Kearny, San Francisco
Jebe's Photo Shop, 4661 Mission St., San Francisco
San Jose Camera Shop, 245 S. First, San Jose
Anderson's Photo, 1124 State Street, Santa Barbara
Del Garver Photo, 3228 E. St., San Bernardino

COLORADO

Colorado Visual Aids, 1624 Broadway, Denver
Barber Studio, 1010 8th Ave., Greeley

CONNECTICUT

Justin Hartley, 13 Main St., Colchester
Camera Bar, 44 Asylum St., Hartford
Morris J. Rosinsky, Inc., 177 State St., Hartford

DELAWARE

Lincoln Camera, Union St. and Dela., Wilmington

DISTRICT OF COLUMBIA

Fuller & D'Albert, 815 Tenth St., N.W.

GEORGIA

Frye's Camera Store, 220 Luckie St., N.W., Atlanta

IDAHO

Tollenaar Photo, 710 Main, Lewiston
The Ross Hall Studio, Sandpoint

ILLINOIS

Watlands, 13039 So. Western Ave., Blue Island
Central Camera Co., 230 S. Wabash Ave., Chicago
The General Camera Co., 6422 No. Western Ave., Chicago
4020 No. Cicero Ave., Chicago
Merchandise Mart, Chicago
Wolk Camera Co., 133 N. Wabash Ave., Chicago

INDIANA

Schilling's, 329 S. Lafayette Blvd., South Bend
Sunny Schick, 407 W. Washington, Fort Wayne

IOWA

Morris Sanford, 215 3rd Ave., Cedar Rapids
Cinacore Camera, 217 Brady, Davenport
Beuverdale Photo, 2641 Beaver Ave., Des Moines
Hutchinson Camera, 90 E. 4th St., Waterloo

MASSACHUSETTS

Ralph Harris Co., 16 Bromfield St., Boston
Hawes Photo Shop, 36 Province, Boston
Ferranti-Deigo, Inc., 1252 Mass. Ave., Cambridge
Chicopee Camera Center, 44 Center St., Chicopee

MICHIGAN

Follett's, 322 S. State, Ann Arbor
Detroit Camera Shop, 325 State St., Detroit
Guild Camera, 13915 Harper, Detroit
Flint Camera, 144 E. 2nd St., Flint
Marfa Photo Shop, 3822 S. Division, Grand Rapids
Studio Camera Shop, 20229 Mack, Grosse Pointe Woods
Van's Photo Service, 524 E. Michigan, Lansing
Expert Camera Shop, 57 W. Huron, Pontiac
Dunn's, Inc., 116 E. Royal Oak
Saginaw Photo Supply, 515 E. Genesee Ave., Saginaw
Feldman Camera, 300 Oak St., Wyandotte

MINNESOTA

Century Camera Shops, 26 So. 7th St., Minneapolis

MISSOURI

Bernard's, 4724 Broadway, Kansas City
Hillmann's Camera, 9120 Lockland, Overland
Stanley Photo, 106 N. Broadway, St. Louis
St. Louis Photo, 3400 Lindell, St. Louis

NEBRASKA

Calandra Camera Stores, Council Bluffs and Omaha

NEW JERSEY

Moyer's Photo Shop, 130 E. Hanover, Trenton

NEW MEXICO

Hanna & Hanna, 218 Central Ave., S.W., Albuquerque

NEW YORK

Camera Land, 611 Lexington Ave., New York
Abe Cohen, 142 Fulton St., New York
Dowling's, 175 5th Ave., New York
Jaycee Camera Exch., 20 E. 53, New York
United Camera, 1140 6th Ave., New York
Wall St. Camera Exchange, 80 Wall St., New York
Woolfingbush's, 110 W. 52nd St., New York

OHIO

Sid's Camera Exchange, 451 E. Exchange St., Akron
Black's, 232 Wooster Rd., N. Barborton
Camera Craft, 31233 Shaker Square, Cleveland
Dodd Co., 1023 Huron Rd., Cleveland
Hemmings, 15809 Lorain, Cleveland
Premier-Price Inc., 10107 Euclid, Cleveland
Stropky, 128 Fair N.W., New Philadelphia
Otto G. Graeff Inc., 3483 Lee, Shaker Heights
Toledo Camera Shop, 225 Huron, Toledo

OREGON

Coburn Film Shop, 698 Williamette, Eugene
Dot Dotson's, 107-111 E. 11th, Eugene
Leo's Camera Shop, 836 Main, Klamath Falls

PENNSYLVANIA

Sterling's, 449 Northampton St., Easton
Cosgrove Camera, 27 W. Broad St., Hazleton
Photomart, 8 So. 6th St., Philadelphia
Klein & Goodman, 132 S. 11th St., Philadelphia
Rosenfeld Photo, 1304 Walnut St., Philadelphia
Alton E. Bowers Photo, 416 N. 5th St., Reading

RHODE ISLAND

United Cam., 69 Dorrance/607 Westminster, Providence

TEXAS

Oahman's, 601 Fannin, Houston

VIRGINIA

Campbell's Camera Center, 25th & Atlantic, Virginia Beach

WASHINGTON

Bremerton Photo Supply, 285 Fourth St., Bremerton
Tall's Camera, 1415 Third Ave., Seattle
Harold Meyer Drugs, 1108 So. Kay St., Tacoma
Anderson's Camera Shop, 110 No. 2nd St., Yakima

WISCONSIN

Camera Center, 3050 N. Oakland, Milwaukee
Photoart, 840 N. Plainfield Ave., Milwaukee

When the chips are down...

ALPA Retro-focus 28mm f/3.5 preset. Extreme wide-angle lens.

ALPA Makro-Kilar 40mm f/2.8 preset. Focuses from inf. down to 4" or 2" without accessories.

ALPA 100mm f/2 preset APO-CHROMAT. Extra-fast portrait and telephoto lens with exclusive 3-color correction.

ALPA Tele-Xenar 135mm f/3.5 Telephoto lens with automatic diaphragm.

ALPA Tele-Xenar 360mm f/5.5 preset. Extreme telephoto lens.

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ALPA

ALPA 8 with Kern Switar 50mm f/1.8 Automatic APOCHROMAT — Exclusive 3-color correction.

Exclusive Features of ALPA LENSES

- **ALPA APOCHROMATS:** Kern Switar 50mm f/1.8 and Kinoptik 100mm f/2 APOCHROMATS render exclusive correction of all primary colors, critical sharpness and highest contrast, even at full aperture.
- **ALPA ALL-IN-ONE LENSES:** Makro-Kilar 40mm f/2.8 focuses continually from inf. to 4" or 2"; Makro-Kilar 90mm f/2.8 from inf. to 8", without accessories.
- **DETACHABLE EXTENSAN MOUNTS** of the 75, 90, 100, 125 and 180mm ALPA lenses have extreme focusing range (20mm!), which can be replaced by bellows for continuous focusing from infinity all the way down to ultra-close-ups!
- **AUTOMATIC LENS DIAPHRAGMS** requiring minimum pressure and extremely lightweight lens mounts permit hand held pictures at slow speeds, even with telephoto lenses.
- **100% LENS CONSISTENCY:** Each ALPA lens undergoes two scrupulous quality control tests — by the lens manufacturer and at the ALPA factory...and carries an UNCONDITIONAL guarantee for highest optical performance.

Write for illustrated brochure MA-10.

In photography as in poker, you're always ahead with all the aces up your sleeve.

With ALPA's "Full-House" of top quality lenses ranging from 28mm wide-angle up to 3750mm super-telephoto (75x magnification!) and the traditional Swiss "CHRONOMETER" precision of the ALPA 35mm SINGLE-LENS REFLEX camera, you'll always be playing a winning combination...FOR ANY TYPE OF PHOTOGRAPHY.

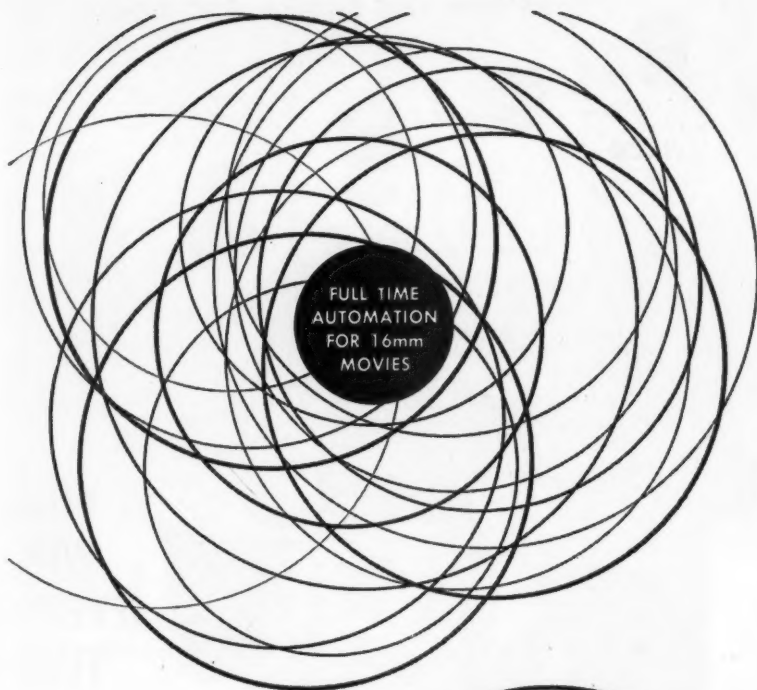
Only ALPA provides you with lenses of the highest possible degree of optical correction. And only ALPA cameras can provide you with so brilliant and exacting a ground glass image in full "Lifesize" for accurate framing, focusing and depth-of-field control — with any lens, at any distance, for any magnification, with no parallax ever...*the "nearest thing to the living eye!"*

LENS	MM F/	PRICE	LENS	MM F/	PRICE
*Retrofocus	28 3.5	\$139.00	*Makro-Kilar	90 2.8	\$249.95
*Alpagon	35 3.5	\$109.00	*Kinoptik	100 2	\$299.00
*Makro-Kilar E	40 3.5	\$ 89.95	*Aliguar	135 3.2	\$139.00
*Makro-Kilar D	40 2.8	\$119.50	*Tele-Xenar	135 3.5	\$159.00
Xenar	75 3.5	\$109.00	*Alefar	180 4.5	\$159.00
Xenon	80 2	\$129.00	*Tele-Kilar	300 5.6	\$179.00
*Altair	90 2.8	\$139.00	*Tele-Xenar	360 5.5	\$209.00
			Reflectors to 3750		
*Preset	**Automatic				on request

ALPA 4 (Straight Refl.) from \$199
ALPA 5 (Prism Refl.) from \$279
ALPA 6 (Prism Refl. w/built-in rangefinder) from \$319
ALPA 7 (Prism Refl. & separate rangefinder) from \$319
ALPA 8 (Prism Refl. w/built-in & separate rangefinder) from \$349



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C16 Remarkable development in this age of "automation"! This is the *only* 16mm movie camera of professional design offering "electric eye" automation. And because the man owning a camera of this high caliber wants to *direct*, not be *directed* by, his movie equipment, EUMIG's electric eye is *controlled* at all times! Visible electric exposure control, always in view *while shooting*, always *ready to be guided* by the cameraman, *always operative* with every film type, every shooting speed, every filter . . . this is the remarkable C16! Features include two-eye 1:1 parallax-corrected viewing, variable speeds from 16 to 64 F.P.S., the famous EUMIGAR 25mm f1.9 focusing-mount normal lens, and so many more vital professional features . . . all for only \$289.95. This is a camera so advanced in concept,

it must be examined by any serious movie maker. At Franchised UNIMARK Stores coast-to-coast, or write for complete details to:



UNIMARK PHOTO INC.

128 West 31st Street, New York 1, N. Y.

SEE THE BEST—SEE EUMIG, EUROPE'S FIRST NAME IN CINEMATOGRAPHY

NEW PRODUCTS

(Continued from page 20)

trolled heat. Measurements of the dryer are 23 1/4 x 15 x 24 in. It uses 900 watts, 110-15 volt AC and shipping weight is 76 lbs. Price of the Beseler 1217K dryer is \$345. Write:
CHARLES BESELER CO.
220 S. 18 ST., EAST ORANGE, N. J.

No Image Blackout with Topcon-R



A rapid return mirror that flips out of the way an instant before exposure and returns almost instantaneously afterward, ends image blackout on the Japanese Topcon-R eye-level prism reflex 35mm camera. The Topcon-R has a bayonet-mounted Auto-Topcon 58mm f/1.8 lens of 6-element design with an automatic diaphragm. Other features include: focal-plane shutter, speeds from 1 to 1/1000 sec., X and F synchronization, single stroke rapid advance lever, folding rewind crank and interchangeable focusing hood. Price of the Topcon-R is \$269.50. Write:

TOKYO OPTICAL CO., LTD.
103 FIFTH AVE., NEW YORK, N. Y.

New Polariflash Sizes

Two new Polariflash sizes have been introduced to accommodate reflectors smaller than 5 in. The Polariflash is designed to cut down reflection and glare when shooting people wearing glasses, shiny surfaces, paintings and other photographic subjects where a polarized light source is helpful. It fits over the regular flash or electronic flashgun reflector with a snap-on device. The first units were made to fit over 5-in. reflectors, while the newer ones fit 3 1/4 and 4 1/4-in. reflectors. Price of the Polariflash units are: 3 1/4-in., \$7.50; 4 1/4-in., \$9.50; and 5-in., \$10.95. Write:

ENTECO INDUSTRIES, INC.
610 KOSCIUSKO ST., BROOKLYN 21, N. Y.

Extension Bellows for Praktina



An extension bellows for use with wide-angle, normal and moderate telephoto lenses can now be had for the Praktina FX 35mm eye-level reflex camera. Maximum extension of the bellows is 2.5 in., while closed it measures only 0.3 in. When used with a 50mm lens, magnification range is from 1/10 life size to slightly more than 1 to 1. In bellows operation, only lens-to-film distance changes during focusing, while lens-to-subject distance remains constant. With a short barrel tele lens, the bellows provides a focusing range from 2 in. to infinity. For magnifications of more than 1 to 1 the Praktina FX extension tubes may be used. Other features include twin-track construction and aluminum alloy body. Price of the bellows is \$69.50. Write: STANDARD CAMERA CORP.
319 FIFTH AVE., NEW YORK 16, N. Y.

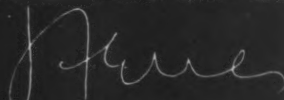
Kodak Type C and Type R color print materials have new names—Kodak Ektacolor paper and Kodak Ektachrome paper, respectively. Ektacolor prints made directly from color negatives, while Ektachrome paper is designed for making prints from transparencies. Write:
Eastman Kodak Co., Rochester 4, N. Y.
(Continued on page 114)

If You Want To Know About The

EXAKTA CAMERA

ASK THE MAN WHO OWNS ONE!

"EXAKTA" photography is exciting. I get wonderful pictures with my EXAKTA! For stage and telephoto work, there's nothing better"...



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Broadway Musical Hit Show,
"OH CAPTAIN"



The JOSE FERRER PRODUCTION
TONY RANDALL
OH CAPTAIN!
the new
musical comedy
© "THE CAPTAIN" PARADE

More and more people appreciate the many ingenious and desirable features offered only in the Exakta Light-Meter Iia camera... 26 different shutter speed settings from 1/1000 to 12 seconds, plus bulb and time, built-in MXF flash synchronization, built-in photo electric cell exposure meter, interchangeable viewfinders, penta prism eye-level viewfinder, waist-level reflex viewfinder, split-image rangefinder, rapid lever film advance and shutter cocking, built-in film cutting knife, and more.

See the new exciting Exakta Light-Meter Iia camera with built-in Exposure Meter and Penta Prism eye-level Viewfinder, Split-Image Rangefinder and 58-mm., F/2.0 Carl Zeiss Jena Biotar lens with Automatic Diaphragm! At your dealer now. Write for free colorful brochure.



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FREE
"sample copy"
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EXAKTA
MAGAZINE

ATTENTION! Tourists Going Abroad:
New Exakta money-saving purchase plan now available. Write for details!

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Exclusive Factory Appointed Representative in the U. S. A. for Sales & Service of Exakta and Exa Cameras



They said it couldn't be done!
But *Konica* has merged
Single-Lens Reflex **VIEWING ACCURACY**
with the **HANDLING SPEED** of
the Rangefinder 35mm!

**STARTLING
NEW
CONCEPT!**

New in 1930—The coupled rangefinder with two-eyepiece viewing!

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1950—Bright outlines and parallax correction!

BUT . . . until today . . . the one
feature needed for true professional results,
has always been missing!

1958—NOW . . . it is here in a startling new concept from
KONICA . . . pioneers in revolutionary camera design!

NOW—ONLY WITH KONICA 111A:

1:1 single-window view focusing, bright
outlines, parallax correction, PLUS . . .
*continuous field accuracy from 3½ feet
to infinity!* THIS MEANS . . . you get
*exactly what you see . . . no more, no
less!* Other rangefinder 35's compen-
sate for parallax, BUT . . . not for lens

field variations. To prevent cut-off views, these cameras give you more than you
want! With KONICA 111A, through-the-lens viewing accuracy is yours near . . . or far!
KONICA has taken THE BIG STEP FORWARD in camera design . . . *once again!*

With other rangefinder 35's:

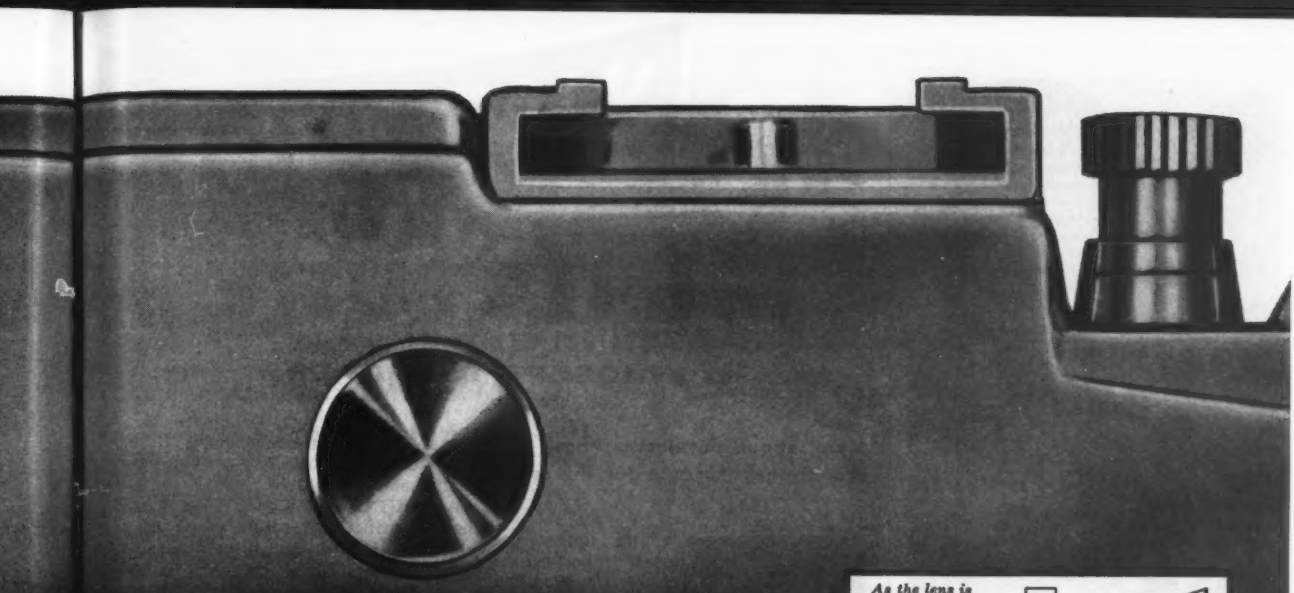
*The picture you see is
not the picture you get.
You usually get what
you don't want (as
shown here)!*

**KONICA 111A gives you
exactly what you see!
no more, no less!**



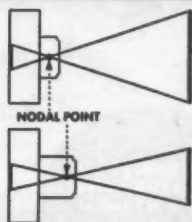
you see this

but get this!



PLUS: Compensation for slide-mount frame • 50mm Hexanon f1.8 lens, faster and even finer than world-renowned 48mm f2 predecessor • rapid action film advance • fully synchronized 1 sec. to 1/500th shutter • built in self timer • rapid rewind.

As the lens is focused on closer objects, its angle of view decreases because its "nodal point" moves forward. This decreasing (and at greater distances, expanding) angle of view is compensated for only in the new KONICA IIIA.

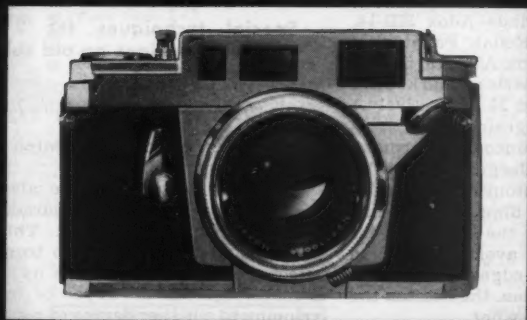


"The lens alone is worth the price!"

the startling new

KONICA IIIA

\$129⁹⁵
plus case



STILL AVAILABLE!

KONICA III... the camera that first revolutionized 35mm camera standards... with detachable exposure meter, famous Hexanon f2 lens, and all its other professional-approved luxury features!



For a SENSATIONAL KONICA IIIA TRADE-IN OFFER...

write for name of your nearest dealer and tell us what you want to trade.



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IN CANADA: McQueen Sales Co., 1843 W. 4 Ave., Vancouver 4, B. C. IN VENEZUELA: Seijiro Yawana, Apartado 3179, Caracas

Mfg. by KONISHIROKU PHOTO IND. CO., LTD., TOKYO

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What
The
Experts
Say

"The GaMi 16 is in an
'ultra' class of its own,
beyond competition from
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by Joseph D. Cooper,
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ULTRA MINIATURE

by **JOSEPH D. COOPER**

More about developers; how to choose the best one for the job.



The starting point in selecting a developer is a knowledge of film characteristics. No developer is best for all films. It is up to you to choose the one which suits the particular emulsion you are

using. Stated otherwise, a developer should be chosen for its chemical compatibility with the film and for the physical results of the chemical interaction.

Let's follow this through in the case of the relatively slow, thin-emulsion films I have consistently recommended for use in ultraminiature cameras. These are fine grain films which produce knife-edged image contours, but tend toward high contrast and blocked highlights. (The slower thin films presently packaged in loads for ultraminiature cameras include Adox KB-14, Ilford Pan-F and Kodak Panatomic-X. The present Minox ASA 25, 50 and 100 films in the American market are Adox KB-14, 17 and 21 respectively.)

Actually, a fine grain developer is not too important, since the sharpness of detail in your enlargements results mainly from the contour sharpness (or acutance) of these films. In fact, fine grain developers of the silver solvent variety are to be avoided since, in eating away at the edges of the silver grains in the emulsion, they soften the edges of detail somewhat.

The most important quality of a developer for these films is its ability to offset the tendency toward contrasty negatives. Some of the developers which do this are Edward Minicool, FR X-22 and Tetenal Neofin Blue.

On the other end of the film scale are the two ultrarapid films available in ultraminiature loads: Ilford HPS and Kodak Tri-X. No matter what developer you use, they will give you grainy images. These films tend toward low contrast. Your developer, therefore, should be one that builds up contrast. Some of the developers suitable for these films include Clayton P-60,

Edwal Fine Grain Concentrate No. 2, Ethol UFG, FR X-500, Ilford Microphen and Kodak D-76.

Adox KB-17 and Kodak Plus-X are the two principal medium speed films currently loaded for ultraminiature cameras. For either film you can use fine grain, moderate contrast developers, of which many are available. Plus-X is a favorite of many photographers who like to do available light work, with Promicrol as their developer to utilize film speeds to the maximum.

While you can use various developers with Minox films, I have found the special one-shot Minox developing powders excellent with all four black-and-white films presently available for the Minox.

If you load your own cassettes, I suggest you refer back to John Wolbarst's excellent compendium of film-developer combinations in the June 1958 issue of MODERN. In that and subsequent issues he presented the re-

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sults of his extensive research into the developer problem.

Of course, developers are also selected with regard to the characteristics of lighting and subject. Thus, if subject and lighting add up to a flat effect, you may compensate by using a more vigorous developer or by developing to a higher degree of contrast.

Generally, however, your roll of film will have from 20 to 50 exposures made in a variety of lighting conditions of many different subjects. Some shots may be overexposed, some may be under. In some the contrast may be great, in others it may be low. If this is the case, your best bet is to standardize on one developer for the film you ordinarily use.

Finally, if you have any doubts on choice of a developer, follow the advice of the film manufacturer. He knows his film material and its chemical reaction to various solutions.

—THE END

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35MM

by JOHN WOLBARST

Standards of quality #2: How to look for "ideal" negatives.

Last month, in the first of a series on 35mm black-and-white technical quality, I tried to give some idea of the physical characteristics of "quality" prints in terms of image sharpness, graininess, and range of tones. Also, I suggested some standards which anyone might apply to his or her own prints in order to judge their technical quality.

Now, working backward from the print, here are some pointers about the type of negative which will most easily meet those standards.

There is no single magic practice or formula, no one developer/film combination, no special technique which will automatically insure ideal negatives for enlargement. It is possible to achieve technically excellent negatives with many films, in all speed ranges from very slow to high speed, with a wide variety of developers. True, certain film/developer combinations can produce sharper and less grainy pictures than others, just as some combinations give higher film speeds. But within each film speed group there is a great range of technical quality possible—from very poor to excellent.

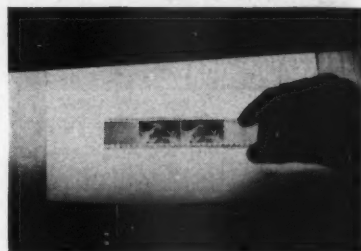
Of course, nothing is more important than using a film/developer combination suitable for the picture taking job at hand. I'll discuss this in detail later, but presently let's assume a wise choice was made.

Negatives of high technical quality start with correct exposure. I should say correct minimum exposure. The ideal negative should have received just enough exposure to record all important shadow details. Any exposure in excess of this amount cannot do the negative any good, and while a small amount of extra exposure may cause no noticeable loss of quality, there is no question but that real overexposure does degrade negative quality.

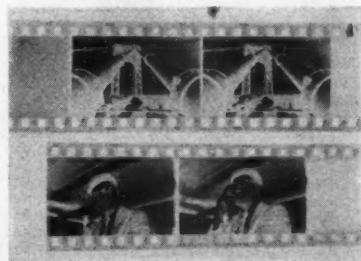
Since every performance characteristic of a film is controlled to a large degree by the type of developer used, it follows that before exposing the film you should have a pretty good idea of what developer will be used. If not the exact developer, then at least the class of developer—very fine grain, low energy type; fine grain, moderate energy; medium fine grain, powerful; dynamite soup.

In my 35mm film/developer charts (MODERN, June 1958) each of the 226 combinations carried an indication of the exposure index to be used with that

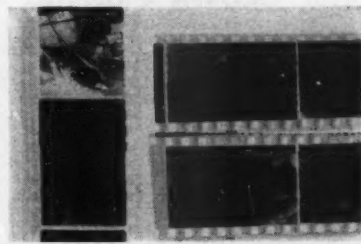
(Continued on page 30)



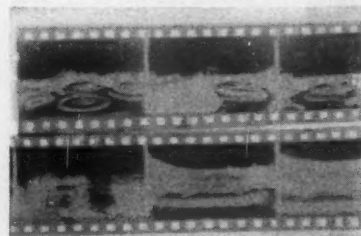
1. This is one of the best ways to examine negatives. All the light must be behind the film.



2. These are examples of "ideal" 35mm negatives. Incidentally, they were a positive joy to print.



3. Too dense. The result of overexposure, overdevelopment, or both. These were very tough to print.



4. Too thin. Underexposure, plus an error causing underdevelopment. These never printed well.

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35MM

(Continued from page 28)

combination. These recommendations were based on an "average" exposure with a reflected light meter (halfway point between highlight and important shadow readings), or on a reading with an incident light meter.

Now we've processed the negative as recommended. How do we judge the result? Will it enlarge well or not? Let's assume that it was sharply focused in the camera.

To begin with, a negative should never be viewed by holding it up to a bright light or a window. Use reflected light. Shine a lamp on a piece of white paper, hold the negative so all the light is behind it as in photo 1.

Naturally, a well-made, diffused light box or transparency illuminator also makes a good negative viewer.

The "ideal" 35mm negative should look much like those in photo 2. Note the transparent look of even the densest highlight areas. You should be able to read normally dark magazine type through the densest important part of an "ideal" negative. Replace the blank white sheet with a page from MODERN. Can you clearly see the type even through important areas recording a light (even a white) subject? If not, the negative is too dense, due to overexposure, overdevelopment, or both, as in photo 3.

What about the important shadow details? Are they visible? If not, then the negative is underexposed, underdeveloped, or both, as in photo 4.

The negative should show a wide range of densities—that is, it should have a certain amount of contrast, like those in photo 2. Given "average" lighting, excessive negative contrast (as in the dock scene, photo 3) generally is a sign of overdevelopment; total lack of contrast, as in photo 4, is usually a sign of underdevelopment. Of course, the kind of light on the subject has much to do with negative contrast.

Negatives such as those in photo 2, blown up in a semi-condenser enlarger such as the Leitz Focomat, will print beautifully on "normal" grades of enlarging paper. Because the images are delicately thin the exposure times will be brief, even with the enlarger raised to maximum height. Whatever the film/developer combination, graininess will be at the minimum, sharpness at the maximum possible for that film/developer combination.

Negatives such as those in photo 3 will be murder to print. Being dense, very long exposures will be needed, with the added risks of vibration, unsharpness and fogging. Graininess is bound to be objectionable, and maximum sharpness can never be had.

The negatives in photo 4 cannot produce a print with a full, rich range of tones. They'll be muddy. To get any snap you'll need to use the most contrasty paper possible. Details will be missing. At best, the prints will be a hard-earned flop.—THE END

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Ways and Means

by **ARTHUR ROTHSTEIN**

Technical Director of Photography, *Look Magazine*

The camera is supreme in a significant area: In copying paintings.



Few photographers are aware of the skill and technique necessary to perform the activity in which the camera is a superb tool—making a copy. And one of the most exacting

types of photographic copying is that involving works of art.

The importance of this becomes apparent when you realize that masterpieces of art in museums are not readily accessible, and that for purposes of study, art education and reproduction in books and magazines, it is mandatory to make photographic copies that are as faithful as possible.

When I have an assignment to copy a painting, it is usually at a museum, a private collector's home or in a warehouse. I choose an 8 x 10 view camera, if I know that the painting can be moved to a convenient working height for positioning the cameras and lights.

However, if the painting is inaccessible, high on a wall, stuck in a corner, or crowded into a small room, I choose a 35mm camera.

The 8 x 10 Deardorff camera has a 12-inch, f/6.3 Commercial Ektar lens. In 35mm, I prefer a single-lens reflex, such as the Alpa, Exakta or Asahi Pentax with a 50mm f/3.5 lens. Since paintings don't move, and I always bring my own lights, a small aperture lens is not needed. It is more important to have a well-corrected lens that provides good resolution. In this regard, I obtained some unusual details of brush strokes on one of Monet's famous water lily paintings with a Nikon SP and a Micro-Nikkor 50mm f/3.5 lens.

I use Ektachrome 8 x 10 sheet film, and Kodachrome in 35mm size. Although Anscochrome sheet film seems to have more latitude in exposure and slightly finer grain, I find that Ektachrome produces a more definite black. In 35mm, of course, Kodachrome cannot be equalled for its color, its blacks, and its fine grain.

I keep the lighting simple. Since most places where paintings are displayed are not equipped to handle high amperages, I do most of my 35mm work with four RFL-2 photofloods, on PIC light stands. Some photographers use a Colortran converter to insure accuracy of color temperature when working under adverse current conditions. Kodachrome Type A is balanced for RFL-2 floods, and may be

exposed at ASA 16 without a filter.

When working with an 8 x 10 camera, I replace the RFL-2 floods with Sylvania R-32 reflector photofloods. These are balanced for Ektachrome Type B at ASA 10 without a filter.

There is an advantage in not using a filter, because it slightly reduces the resolution of the lens.

The painting is set up vertically on a solid support. I sometimes turn it upside down so that it is right side up on the view camera ground glass.

Regardless of which camera is used, large or small, the painting must be positioned in relation to the camera so that the painting will appear undistorted. With a ground glass, this can be checked easily. I use a small plastic 90° triangle, and compare the corners of the painting on the ground glass to the triangle to determine whether each side is at right angles.

When using a 35mm camera, another method may be used. I learned this from Bob Hagelstein, whose grandfather photographed paintings as long ago as 1866! Simply tie a string around the lens. When the string is the same length from each corner of the painting, it is square in the camera!

The next step is to place the lights at a 45° angle to the painting. The aim is to provide even illumination, and to avoid objectionable reflections. With some heavily painted canvases, light bounced off a white card may be used, combined with a glancing direct light to create a slight specular reflection. I examine the lighting on the ground glass or through the viewfinder, and move the lights until the reflections are gone, or just enough to bring out the brush strokes. An incident light meter is useful to check even illumination.

Before making the exposure, I always check the bellows extension of the camera. In copying small paintings, the extension of the lens beyond its rated focal length will require an increase in exposure because the amount of light falling on the film is inversely proportional to the square of the distance from the lens to the film.

With most lenses used on 35mm cameras, a chart is provided to indicate the effective aperture when the lens is used for close-ups. The effective aperture may also be figured:

$$\frac{\text{lens-to-film distance}}{\text{focal length of lens}} \times \text{marked lens aperture} = \text{effective aperture}$$

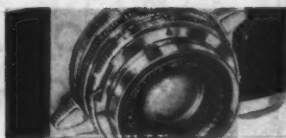
For example, if I found the correct exposure to be f/16 and 1 sec., and then had racked out my 12-in. lens to 18 inches, the effective aperture of the f/16 setting would be f/24 (18/12 x 16=24). My shutter speed at f/16 must be doubled to 2 sec.—THE END

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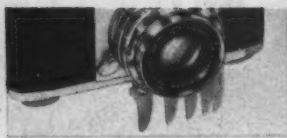
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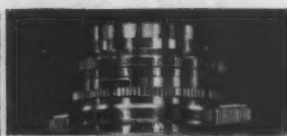
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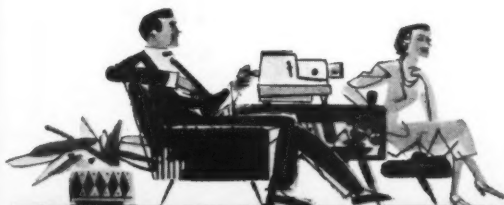
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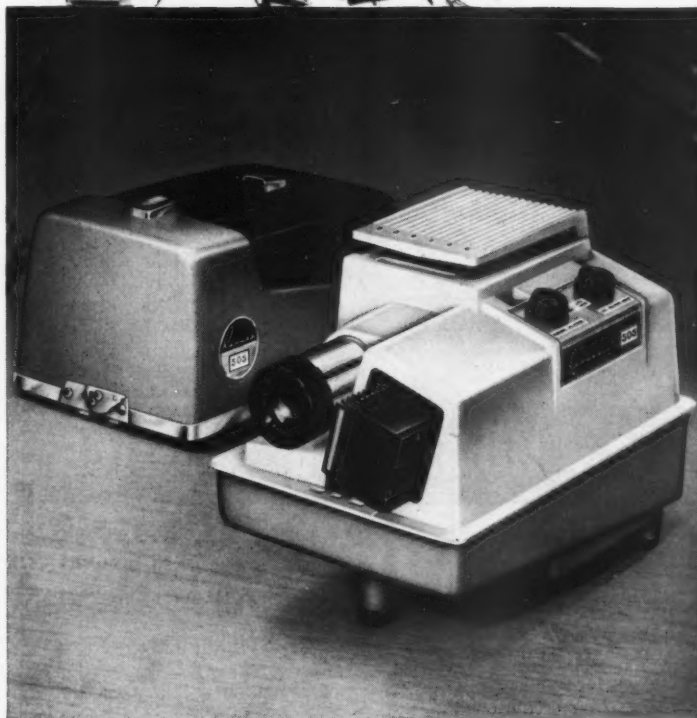
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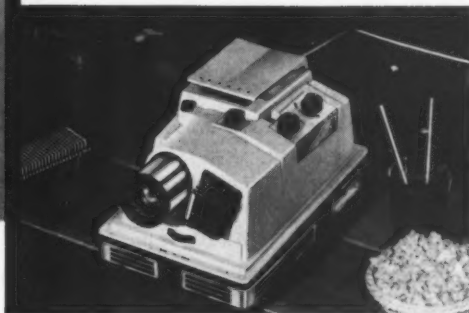
Model "503" Auto-Magazine 35MM Slide Projector—300 Watt illumination. So easy to operate, even a child can show slides in sequence, skip-selected or re-projected. Equipped with WOLLENSAK 5" F/3.5 coated, color corrected anastigmat lens; built-in pointer; 36 slide magazine tray; handsome two-toned "Royalite" plastic slip-over case and a host of other features exclusive with Revere.

Model "505"—Same with 500-watt illumination—\$69.50

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Here in all its triumphant beauty is the ultimate in low-cost finger-tip automatic slide projectors! Compact, streamlined and loaded with outstanding features, the Revere "503" or "505" is an unmatched combination of simplest operation . . . smooth performance . . . extremely low cost. Each touch of the finger automatically shows any of 36 slides (including 1½" x 1½" slide format when No. 3 condenser is replaced with accessory L-140 condenser lens) . . . all types mounts, mixed. No protruding magazine adapters; nothing to assemble or attach. Just slip off the case, insert magazine tray and you're set for the show. See these new exciting slide projectors at your Authorized Revere Dealer NOW!



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CA-1-Electric Eye-Matic 8mm Spool Camera—Completely automatic; F/1.8 lens; drop-in load. **\$139.50**

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One year expiration date • Fully guaranteed

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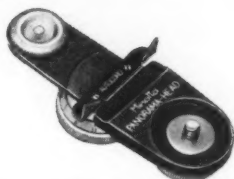


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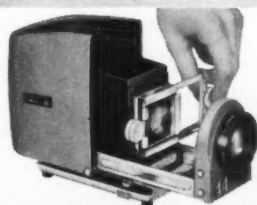
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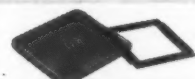
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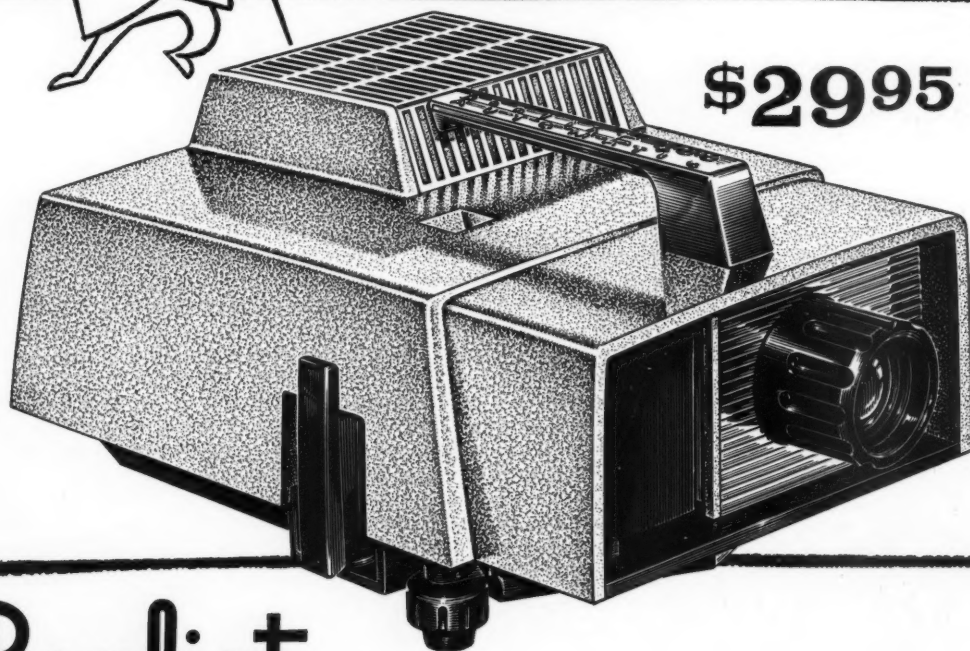
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Shows 2 1/4 x 2 1/4 slides "big as life." Adaptable for showing 127 square Super slides, half a stereo pair and Polaroid. Blower cooled. Features 300-watt Tru-Focus lamp. . . . **\$39.95**

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MORE FACTS NOW REVEALED

ABOUT JAPANESE CAMERAS & LENSES

Last month, readers of Modern Photography read the revealing fact-filled-article concerning Japanese cameras. Then . . . we expected the mails to be swamped with questions, orders and reservations. While we cannot possibly tell everything about the Japanese photographic industry, we shall, however, attempt to provide some additional facts the public should know about the truth of the craftsmanship exercised in the manufacture of Japanese Optical goods.

To-day, you're going to read why the spread has (in the past), been so wide between the prices of these excellent products in Japan and the prices in Stateside. You're going to learn why a distinctively different looking precision camera can NOW be sold in America at such an incredible low price.

TOO MANY COOKS SPOIL THE BROTH

As everybody knows, the normal channel of distribution of Japanese cameras usually is from the manufacturer—to the exporter, from the exporter—to the importer—from the importer to the distributor and then—to the dealer's shelf. In other words, by the time the equipment reaches you, the user, a number of middlemen have taken their fair profits. However, Sterling-Howard, in dealing directly with the Japanese manufacturer (combined with their large buying power), is able to sell to the consumer directly, thereby eliminating middlemen's profits. Enabling them to offer these certain imported materials at prices far below . . . and wiping out all difficulties with one big swish!

MARK S-2 IS BELOW PREVAILING WHOLESALE OF SIMILAR CAMERAS

A camera takes good pictures because its optics are good. Now here's an important thing. The better the optical glass the sharper the negative. And the sharper the negative the greater life-like clarity of color slides. Poor lenses means distorted pictures, fuzziness, aberrations! Good negatives and positives mean more facets to the photographers creativeness; better pictures; an exciting camera to own! The **MARK S-2** is a camera like that. It is distinctively different in appearance, in workmanship and (most important) in performance. If you like fine precision work and modern design, you love the **MARK S-2**. You'll love the 50mm Amber coated 1:2 lens of amazing optical quality. A seven (7) element lens which has to be tried in order to believe its capabilities.

STOP BUYING CAMERAS WITH GIMMICKS

There is no question that the **MARK S-2** is simple to use. And, it has every desirable feature you'd ever want . . . with a total absence of unnecessary gimmicks to add to the weight and price. There's a rapid-advance "single-stroke" quick-flip lever; a calibrated self-timer; an improved shutter speed dial (nine speeds from one second to one-three hundreds plus-B); penta-iris-blade, behind-the-lens-shutter . . . body shutter release; and, a **SYNCHRO-RAPID** shutter for perfect flash synchronization. No less important is the **COUPLED RANGEFINDER** with the bright single window to ensure perfect composition and sharp focusing on the fastest action shots. There's an illustrated leaflet available which explains this amazing candid-camera. It's yours free of charge by writing to Dept. M-10 L.H. Sterling-Howard Corp., 561 East Tremont Ave., New York 57, N. Y.

EACH CAMERA IS GUARANTEED

That's right! The absolute clincher for every sale we've made is our printed guaranty! Every **MARK S-2** is sold with a 30 day trial period. And, if within this time you are not completely delighted, you may return it for full refund.

In addition, every camera is covered by a full 2 years service guarantee, including ALL parts and labor.

This means if a **MARK S-2** fails in any way Sterling-Howard will foot the bill. Because all **MARK S-2**'s and their lenses have been put through a long process of testing and checking before being released. Each outfit has been checked and received a seal of approval by the Japanese Institute of Optical Science. Complete service and part facilities available in the U.S. No need to return camera ever, to Japan for service!

Frankly, there's no competition to the **MARK S-2** in this price range. For, this camera has been designed with you in mind! You . . . who do not desire old fashioned hit and miss type cameras. The **AUTOMATIC FEATURES** of the

MARK S-2 permits you to concentrate on good composition. You get what you see. You cannot be distracted by adjusting gadgets or gimmicks before getting set for that all important shot.

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MSS, Wayne, Mich.

Very thrilling to receive such a camera. . . . I will take good care of it. . . . But this is a masterpiece of precision.

RM, Fond du Lac, Wisc.

In December 1957 I purchased your **MARK S-2** 35mm camera. I want you to know that I like this camera very much. It is the best value I have ever seen.

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I must admit that it exceeded my expectations. I appreciate the promptness and cooperation extended to me by Sterling-Howard.

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MARK S-2

Why not try the amazing **MARK S-2** with 7 element 1:2 lens today! See if it isn't **EVERY-WORD** we say it is. You need never worry about the **MARK S-2**. This masterpiece of precision never lets you down.

The **MARK S-2** complete, costs just \$69.95. Price includes a 7 element lens; coupled rangefinder; 5 blade-iris shutter; single stroke film transport; automatic operation; delayed action timer; Synchro-Rapid flash; and, fast rewind lever. That's because it's made in Japan, yet it is as fine a precision instrument as costly 35mm cameras costing many times more. In fact, the comparison list price is over \$130.00. Incidentally, the demand for this camera in Europe, America and the Far East is tremendous! **ACT NOW!** To get a **MARK S-2** for yourself or for a gift, mail the coupon below.

Sterling-Howard has worked out an exciting and challenging plan. **DO-NOT-TAKE-OUR-WORD!** Convince yourself. Read our Guaranty of Sale on the lower left of this page. Try the **MARK S-2** for 30 days, and . . . if anything we have said on this page is not true, just return the camera and get every penny back.

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Metal-rimmed leather overready case **9⁷⁵**
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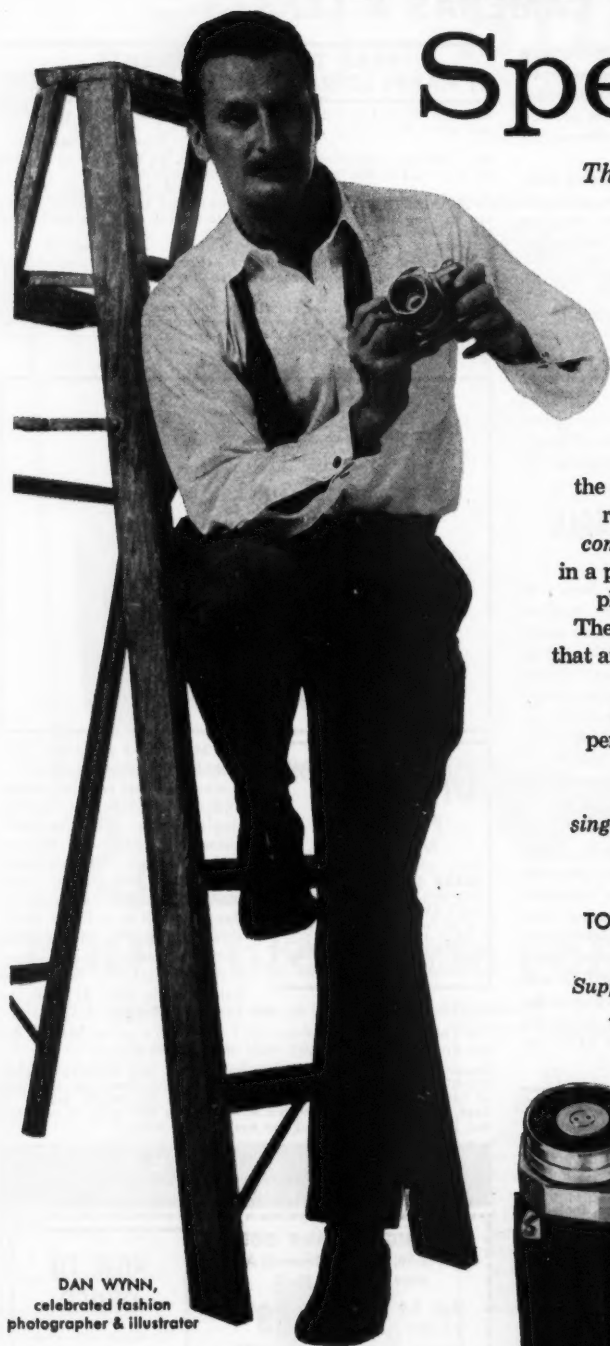
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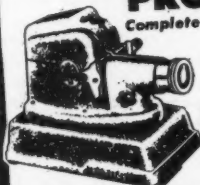
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Complete With Slide Changer



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Original List 399.00 **249⁵⁰**

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300 Watt Slide Projector

With 35mm Slide Carrier

List When New 73.00 **34⁵⁰** Used

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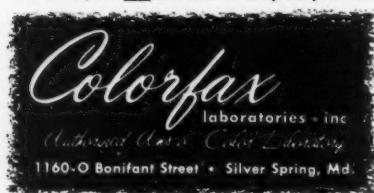
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Sorry we do not ship C.O.D.

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Slide projectors are not like violins. They do not improve with age.



The thousands of slide projectors now in use which are 15 or more years old are not as good as the newer ones. And these older machines with their inadequate cooling systems

are quite capable of fading or burning your slides.

The remedy needn't cost you a fortune, either. On the other hand, once you look into the problem, you may find the more expensive units worthwhile.

You don't have to splurge

For as little as \$24.95 you can get a Mansfield Starlite Projector which will show 46 cardboard mounted slides automatically, and for \$29.95 there is the Realist 400 Automatic machine which accepts up to 30 cardboard mounted slides.

Furthermore, if yours is a fairly recent non-automatic machine which you hate to part with, there's a good chance you can add automation. But more about this later.

Before you rush out and try to buy an automatic machine, let's discuss a few things about automation which will help you make a choice, and will give you some tips on getting the best results with one.

Automatic slide projectors may be divided roughly into the following classifications: a) machines in which the slides are changed by moving a manual lever; b) those in which the movement of slides through the machine is done by an electric motor drive; and c) de luxe machines in which the motor drive is augmented by automatic cycling, remote control, automatic change of direction of slide travel and other features.

What does semi-automatic mean?

The first type of automation, in which the slides are manually changed, is often labeled "semi-automatic." It's probably the least expensive type you can buy and is fine as long as you're willing and able to sit near the projector. Among such inexpensive machines are those made by La Belle, Kodak, Mansfield, Realist, Bell & Howell.

Machines which have electrically operated changing mechanisms cost more but are more convenient to operate. You can also add a remote con-

trol device so you can change slides from quite a distance.

Most expensive of all are projectors which not only have electrically operated slide changers and remote control, but electronic devices which give you wide choice over length of projection time for each slide.

Run it backwards?

In these de luxe versions you can show any slide in the machine at will, run the machine backward or forward, set it to show slides at regular predetermined intervals (automatic cycling), break into a cycle to skip or repeat pictures. All this is done from a push-button control panel or, in some models, from the remote control unit.

Now for a moment let's get back to your old machine. If it's a favorite of yours, throws a bright screen image and is in good working order, it might pay you to add an automatic changer. To find out if it's possible, write to Airequip Mfg. Co. Inc., 20 Jones St., New Rochelle, N. Y. They'll be glad to send you a list of machines their accessory slide changers fit—or tell them the name, make and model number of your machine and they'll let you know if one is available. A semi-automatic Airequip Changer sells for only \$14.95, while you can get electric remote control operation for about \$35.95.

So much for the method by which the slides are moved through your projector.

Magazines differ

Now let's look at some other important considerations. Does the slide changer take cardboard slides only? Will it also take glass slides? How many slides can you show without re-loading?

The heart of most automatic changers is the magazine, tray or other receptacle that holds a series of slides in place and in order of showing.

In simpler machines the changers, which take only cardboard mounts, do not use a magazine or tray. Instead, the slides are placed in a groove and are held in place by a spring-loaded door. They emerge at the other end of the changer restacked for showing again.

The Readymatic of Kodak 300 and 500 projectors, the Presto-Matic in the Mansfield Skylark and Starlite machines, and the Auto Changer for the FR Minolta Mini fall into this category.

With changers of this type it's extremely important that you keep the cardboard mounts in good shape. Replace bent, frayed or torn ones imme-

(Continued on page 44)



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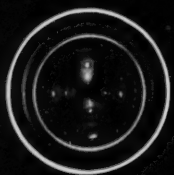
Same size and base as the M-2, these power-packed bulbs let you stop down for greater depth of field—or shoot faster at wider apertures. A pack (12) slips easily into your shirt pocket. Also available M-25B, M-5, M-5B.



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MODERN COLOR

(Continued from page 42)

diately to prevent possible jamming and slide damage.

You're probably more familiar with the regular tray type changing mechanisms. Most slide changer magazines or trays are made of plastic. These hold from 30 to 40 slides. All take cardboard or glass slides, of one kind or intermixed. The slides are dropped into the numbered slots provided and the magazine inserted into the changer or projector.

Airequipt and LaBelle

The Airequipt and the La Belle projectors use metal magazines. In the Airequipt spill-proof magazine, metal frames keep the slides in alignment. These frames accept only cardboard mounts or extra thin glass mounts such as Filmasto or Leitz Pro-Color. The plastic magazines of the Kodak Cavalcade Projector also use metal frames, the Model 1 tray holding up to 40 cardboards, while the Model 2 holds 30 slides which can be cardboard or glass intermixed.

The metal magazines supplied by LaBelle (makers of the first popular automatic projectors) don't have slots or frames for the slides. Instead, they are stacked in the magazines which are put vertically into the projector. The usual magazine holds 75 cardboard or 36 glass slides which may be intermixed. For extra long showings, there is a jumbo magazine which holds up to 150 cardboard or 75 glass mounts.

Stick to one mount

While most magazines take both cardboard and glass slides intermixed, it is wise to stick as much as possible to one type of mounting. Differences in slide mount thickness may in some cases necessitate refocusing during the show. Also try as much as possible to stick to one make of slide mount or mask for each set of related slides. You'd be surprised at the wide difference in actual mount and mask opening dimensions. Some mounts have square corners, others rounded ones. Choose the kind you prefer and stick to them. Of course, if you use special size mounts or masks—such as those made by Gemounts, 5817 Sheridan Ave., Detroit 13, Mich., or Porter Mfg. and Supply Co., 2836 Sunset Blvd., Los Angeles 26, Calif.—to crop a slide for artistic effect, that's a slide of a different color.

Shoot in sequence

One last thing: automation makes it easy for you to load your magazines, trays or changers with slides that can be shown in sequence. Are you shooting your slides in related groups that would make up a nice homogeneous show? No sense in buying an automatic projector if you don't make full use of it.—THE END

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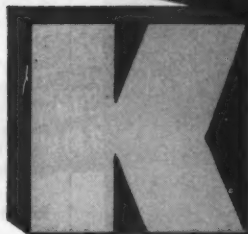
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PICTURES In a MINUTE

by JOHN WOLBARST

At last, two gadgets make it easy to get into your own pictures.



One of the great fun aspects of photography is getting into your own pictures by using a self timer to snap the camera shutter. This is particularly fun when you can see the picture in a

minute. Unfortunately, it has been virtually impossible to use a self timer with Polaroid Land cameras (except the Pathfinder models) due to the design of the camera shutter. (The Model 110A has a built-in self timer.)

As you may know, the Polaroid shutter is of the self-setting type. That is, when you press the shutter release three events happen in sequence.

First, the beginning movement of the release cocks, or sets, the shutter springs, putting them under tension. Second, as you push the release further the tensed springs are released and the shutter clicks, snapping the picture. Third, as you let up on the release the whole mechanism automatically resets itself for the next exposure.

In most cases, an accessory self timer screws into the camera's cable release socket and a pin inside the timer takes over the function of the end of the cable release and prods the shutter into action. However, until recently I never found a self timer with sufficient strength and suitable pin travel to operate the Polaroid shutter properly. They mostly jammed.

A practical self timer

Now let me tell you about the Bower self timer. It's a little, clockwork device resembling many other self timers. However, its mechanism is specially designed for the Polaroid shutter and I'm happy to report that it works like a charm. It's made in Japan, imported by Saul Bower, Inc., 114 Liberty St., New York 6, N. Y., and the list price is \$3.95.

To use it you must first make a preliminary adjustment so that the pin travel matches your camera's shutter. The printed instructions tell you how to do this.

The Highlander cameras require the longest pin travel; I found the 2½ set-
(Continued on page 161)

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the LARGE CAMERA

by **ANDREAS FEININGER**

Staff Photographer for *Life Magazine*

How to find the "best" type of film for a large camera.



One of the great advantages of large cameras over small ones is the fact that, normally, film grain is no problem. As a result, photographers who work with a large camera can choose their negative

material solely on the basis of tonal gradation and emulsion speed, free from the restricting considerations that constantly plague small-camera photographers who have to worry about "grain."

Which film should you use?

The complete freedom with which the large-camera user can select his films has tempted many a photographer to waste valuable time and money on more or less meaningless tests in an attempt to find out which of the many available films is the "best." Although such testing is vitally important for the miniature camera photographer, it is, in my opinion, completely unnecessary to the man who uses a 4 x 5. This was confirmed anew in my mind by this experience:

Some time ago, *MODERN's* editors sent me several sample boxes of German Perutz 4 x 5 sheet film, asking me to run a few tests and to report on the results. Three different types of emulsion were involved: fine-grain Perutz Perpantic Planfilm with a listed speed of 40 ASA; fast Perutz Peromnia-25 Planfilm with listed speeds of 250 to 800 ASA; and matte-back Perutz Portrait Planfilm with a listed speed of 100 ASA. As a control, I used Kodak Tri-X film pack with a listed exposure index of 200 ASA (daylight).

A simple practical test

I decided to make my tests in accordance with the practical requirements of the working photographer rather than the higher scientific standards of the sensitometrist whose laboratory setup does not always duplicate conditions in the field. Consequently, I simply photographed one of the National Bureau of Standards' test charts, exposing all films in accordance with their factory-listed

speeds (using a Weston exposure meter), developing in Kodak Developer D-76, and enlarging to 12½ times linear magnification on No. 3 Kodabromide paper. Then I compared the results.

One thing became obvious immediately: If there are any differences in grain structure among the four emulsions, they are so minute as to be negligible. Eventually, after innumerable examinations of both negatives and prints, with and without a magnifier, I reached the following conclusions: As far as film grain size is concerned, there is no practical difference among the four emulsions, and the fast 250-800 ASA Peromnia film is no grainier than the slow 40 ASA Perpantic film. However, in regard to acutance (edge-sharpness of the image), the Kodak Tri-X film was slightly superior to the fast Perutz Peromnia film of comparable speed. Best in this respect, as was to be expected, was the slow 40 ASA Perutz Perpantic film. In regard to gradation, the Perutz Perpantic film was somewhat (although not much) more contrasty than the three other emulsions, which in this respect seemed to be absolutely identical to one another. This may or may not be an advantage of the Perpantic film, depending upon the type of subject and the circumstances prevailing at the moment of exposure.

Practical conclusions

For all practical purposes, then, only two significant differences remain for a photographer to consider:

1. *The matte backing of the Perutz Portrait film is a definite advantage to the portrait photographer who must retouch his negatives.*

2. *Film speed:* Within reason, a fast film is generally more practical than a slow film since it permits a photographer either to employ higher shutter speeds (and thus to avoid unsharpness due to motion of either subject or camera), or to work with smaller diaphragm apertures (and thus to increase the depth of sharpness), or, to a lesser degree, to combine both these advantages.

A photographer's experience

The conclusions drawn from this test only confirm previous practical experience. Ever since Eastman Kodak first came out with its Tri-X film I

(Continued on page 50)



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THE LARGE CAMERA

(Continued from page 48)

have used this emulsion exclusively for all my routine assignments which had to be shot with a large camera, from 4 x 5 to 8 x 10. And before the days of Tri-X film, I just as exclusively used Kodak Super-XX for all average large-camera assignments. Only under exceptional circumstances do I use other types of film in conjunction with my large cameras.

As a 4 x 5 camera user with over twenty-five years of practical experience—and all my colleagues who use large cameras agree—I have found that for average assignments *standardization on one single type of all-around film* with which one is thoroughly familiar produces much better results than if one were to use several specialized emulsions. Why? Because in the 4 x 5 size, differences in film grain are for all practical purposes negligible, provided that the negative is *correctly exposed and developed*; because a fast (but not a super-fast) film is *always* more practical than a slow film; and because the gradation of the average high-speed film can always be modified to some extent through appropriate exposure and development, making the use of several films with inherently different gradations superfluous. How all this can be done will be the subject of next month's column.—THE END



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The Holson Co., photograph album manufacturer, has announced publication of a new supplement to its complete catalog. It covers such items as new leatherette and genuine leather **albums**, a presentation portfolio, musical wedding album, and many other items. For your free copy, write **Holson Co., 45 Belden Ave., Norwalk, Conn.**

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David Douglas Duncan, former *Life* and *Colliers* photographer, great reporter of the Korean War, made all the photographs within a three-month period during Picasso's 75th year. He spent literally every waking hour with the artist, recording each important one—and some not so—with existing light and a 35mm camera. The pictures are all of excellent quality—sharp and grainless.

There isn't a single photographic masterpiece. Instead, the whole is greater than its parts. Picasso, the man of mystery, is revealed—at home, at work, with friends. Here are his house, his children, his animals. Here is a life bizarre, great, ridiculous, amusing, touching—alive. What else but photography could make this comprehensible?

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There is a text by Duncan. In it he describes his visits to the artist's house. It will probably cause more controversy than the pictures. Some readers will think Duncan overemotional, naively taken in by the cunning old fox of an artist in Cannes. Others may judge it a sober, magnificent document. In any event, it makes good reading.

The pictures are all well reproduced and displayed with the care you come to expect from editor Jerry Mason and art director Albert A. Squillance (who also did *The Family of Man* volume).

Every photographer, or would be photographer, should have this book. There are more truths to be learned in it about picture taking than many photojournalistic contemporaries of Duncan's might like to admit.—H. K.

These and other books are available through **MODERN PHOTOGRAPHY Book Store**; see advertisement on page 112.

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6 1/2x7 1/2	500
7 1/2x8 1/2	500
8 1/2x9 1/2	500
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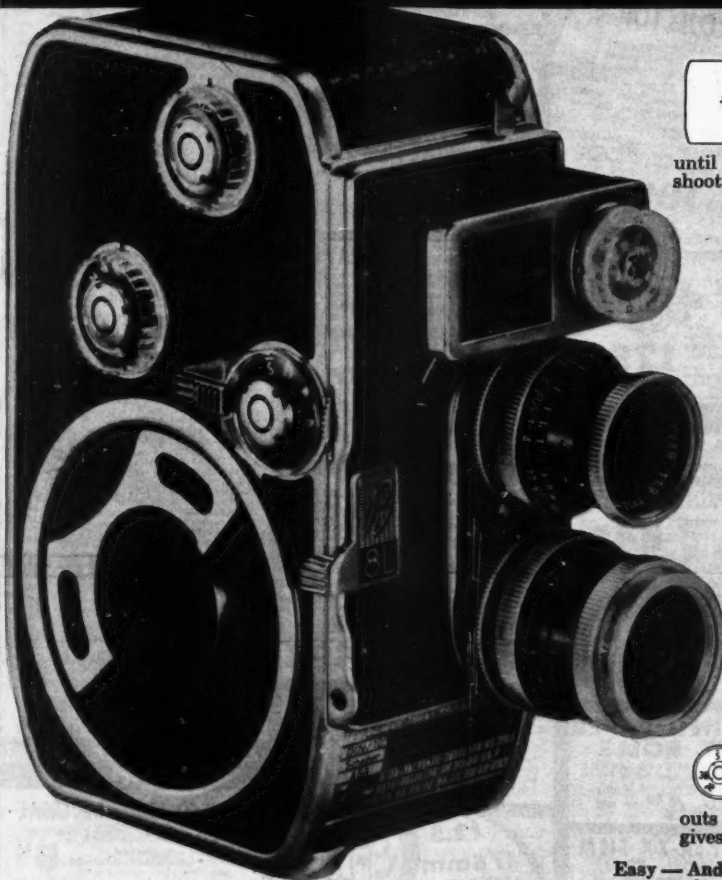
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Bolex put the "eye"
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Its cost with Yvar 1/2" F:1.9 focusing mount lens is \$179.50. With addition of Switar 5.5mm F:1.8 extreme wide angle lens as shown, \$299.00. Write today for literature and the name of the Bolex dealer nearest you, and for information on how you can get the Bolex Reporter Magazine.

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LENS VS. FILM DESIGNERS:

WHO'S AHEAD IN 35MM?

BY C. W. KENDALL
RESEARCH SCIENTIST
AERIAL RECONNAISSANCE
LABORATORY-USAF

TODAY'S 35MM camera, its lenses and the film it uses have reached a truly amazing point of useful excellence. No day or week seems complete without an announcement of a faster film with finer grain or a lens whose quality is said to be superior to that which it replaces. Assuming that much of what we read is more publicity than reality, progress in emulsions and optics still remains breath-taking.

But how far have we really gone on the road to

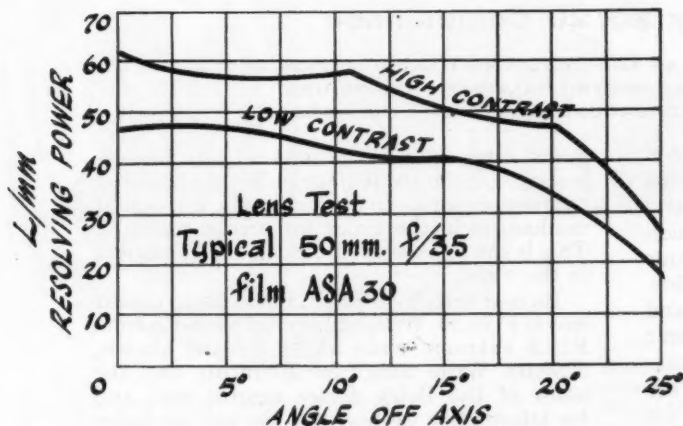
35mm perfection and how far can we go? What's to stop a camera maker, a lens manufacturer and a film producer from some day soon coming up with a combination which can produce pictures indistinguishable from those obtained from the finest 8 x 10 view camera? Will the 35mm camera and film finally replace 2 1/4 x 2 1/4, 4 x 5, 8 x 10, etc? Will 16mm ultra-miniatures eventually replace 35mm—and 8mm, replace 16mm? What's to stop progress?

Of course, if you lend an ear to the more enthusiastic photographer handling 35mm today, he will often insist that the millenium has already arrived and will defend 35mm quality against all. The millenium, however, hasn't arrived, and there's some doubt that it ever will.

You don't have to be a photographic technician, but there are some essential photographic facts which should be understood if you really want to know just what's up and what's likely to come up.

Let's start out with the camera lens. It probably won't come as a surprise that some lenses can make sharper pictures than others, that most lenses used in 35mm cameras produce sharper images at the center than in the corners and that extremely fast lenses of f/2 or so are not so sharp at their widest aperture as they are when closed down slightly.

Photographers have constantly sought ways of testing lens sharpness. Brick walls, newspapers tacked onto walls have both been used. The pho-



HOW GOOD IS YOUR LENS? Using a fine grain film, precise exposure and processing, you can photograph a test chart (illustration, opposite page) and come up with a reasonable account of the capabilities of your lens (see text). This 50mm lens, standard on many 35mm cameras, resolves slightly more than 60 lines/mm at the center of the picture area with a high contrast target (illustrations, opposite). Note how resolution falls to half at the negative corners (25° from the lens axis). Note that a low contrast target always resolves less lines than a high contrast target. That's why pictures having sharp differentiation between highlight and shadow areas generally look sharper.

tographer then carefully examines the negative, or a print from the negative, to see whether the bricks or the print on the newspaper have been reproduced satisfactorily. The word "satisfactorily" is certainly open to wide interpretation.

In more scientific practice, lenses are graded by their resolution in lines per millimeter. A fine grain film is chosen. Exposure is determined accurately and the camera photographs high and low contrast fine-lined targets at a distance determined by the focal length of the lens (illustration, at right). By examining the negative developed under exacting processing, the resolving power of any lens and film combination can be expressed in the number of lines that can be seen clearly and distinctly with a powerful magnifier in one millimeter length of negative area. Tests are often made in accordance with MIL-STD-150, *Military Standard: Photographic Lenses*, 23 October, 1950, Government Printing Office, the only standard approved for testing lenses procured for the Army, Navy and Air Force.

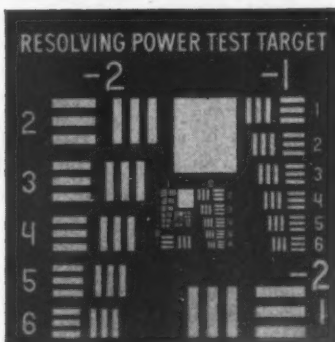
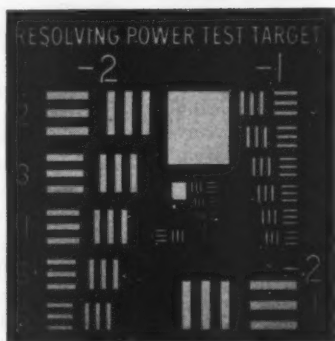
How many lines per millimeter should a lens resolve? There is a limit which, if reached by a lens, would represent the perfect optic. It's called the Rayleigh diffraction limit on resolution. Without actually going into the theory of how Lord Rayleigh arrived at this limit, let's just state the formula!

$$R = \frac{1600}{f\text{-stop}}$$

R is the Rayleigh limit in lines per millimeter and the f-stop represents the aperture at which you are testing your lens. Let's see how this works out in actuality.

Figure 1 represents the performance characteristics of a lens which any 35mm camera fan might own and want to test. It's a 50mm f/3.5 of fairly recent manufacture. It was tested with a modern, fairly slow, high resolution film with a nominal ASA index of 30.

Figures 2 and 3 represent a small section of results of the test at f/3.5. Figure 1 was produced from a high contrast target while figure 2 shows the result of shooting a low contrast target. Actually these contrasts, as you see them here, are not exactly in accordance with the standard since quite a bit of the contrast has been altered in magazine printing. However, the test showed that this lens was sharper at the center than in the corners. Resolution in the corners was roughly half as

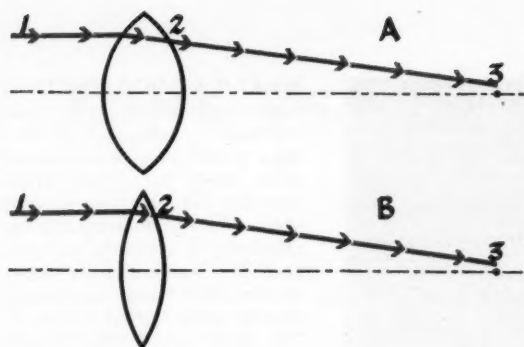


WHAT IS A GOOD LENS TEST?

For a practical test many photographers photograph either a brick wall (top) or a newspaper page taped to a wall. While this test will give you a good idea of how your lens performs, relatively, it certainly isn't precise. The chart (opposite page), on the other hand, was plotted exactly after testing a lens on the center and bottom targets seen here in accordance with the testing standard MIL-STD-150. The test is really so simple anyone can make it. With the results, you can easily determine the exact resolving power of your lens/film/developer combination by examining the negative with a high powered magnifier. Note that we've emphasized the resolving power of your lens/film/developer rather than of the lens alone. Changes in film or developing procedures can alter the final lines/mm resolution radically. You can run comparison tests only if the same film is used in each test and the exact developing procedure is followed for every test roll of film. You should expect better definition from long focal length lenses than from fast wide-angle lenses. Normal lenses of relatively large aperture tend to have a fall off of resolution at the picture edges. Fast lenses also seem to lose definition at extremely small apertures as well as at maximum opening. The test chart can be helpful in showing you just how far you must close your lens aperture for best definition.

good as in the center, a standard ratio with lenses of this type. If you photograph a whole string of charts extending from one corner of your negative to the other, you can pick out with a magnifying glass the finest lines resolved in the center and corners of the negatives. This particular lens we've been talking about resolved 60 lines per millimeter at the center and 30 at the edges. If we use the Rayleigh limit formula to see how sharp a lens of f/3.5 could be, we arrive at a theoretical 450 lines per millimeter, certainly a far cry from the actual 60 lines per millimeter of our test lens. As we'll see, it can't all be blamed on the lens, however.

Our test lens is actually a comparatively good one. While this lens will come closer to the Rayleigh limit of resolution when tested with even slower, thin emulsion films, it cannot exceed or even equal the Ray-



WHAT'S THE FUSS ABOUT RARE EARTH? In order to focus light rays on a specific point, the glass element must have a certain curvature and be of a specific density. Old style glass (A) must be relatively thick in order to be curved sufficiently to bend the light ray (1) to meet at (3). An element containing rare earth (B), having a higher density can bend the same light ray (1) to the same point (3) with much less of a curve. The element containing rare earth is lighter in weight and also cheaper to manufacture than the older lower indexed glass which was used for the same purpose.

leigh limit. The Rayleigh limit was originally designed for comparing optics on telescopes. Unfortunately, the necessity for correcting photographic lenses far exceeds the requirements of a telescope manufacturer. Aberrations did not worry early lens makers to a great degree. Simple magnifiers and telescopes didn't need flat fields of sharpness or reduced chromatic and spherical aberration. Visually these never bothered anyone.

The various aberrations which go completely unnoticed when an optical instrument is used visually show up markedly when the same instrument is put to photographic use. Distortions occur which must be corrected if the lens is to have serious photographic use.

By using various types of glass within a lens, grinding them into specific precise shapes and mounting them carefully, many aberrations can be minimized, if not eliminated completely.

Glass made into the form of lenses has the ability to bend the light rays passing through it. The density of the glass is directly related to the "index of refraction." The higher the index, the more light rays can be bent. Of course, light rays can also be bent by further curving the surface of the glass. But for extreme bends, a lens element of low index glass must be very thick.

Until recent years, lens manufacturers have been quite limited by the angle that light rays could be bent by glass elements. A wide selection of modern high index glasses (using rare earth) gives the designer a freer hand in making corrections. A lens design which might require one or more elements of extremely steep curvature can now be made with high index glass instead. The use of such glass makes top quality lens production cheaper and easier.

The modern lens designer has at his disposal enough glass types to enable him to produce designs for lenses

which were impossible only a few years ago. Optically speaking, you have your choice of some really excellent lenses. But lenses aren't the end all. Final picture quality depends on the film, too—the way it is exposed, how the subject is lit, how the film is developed and printed. Let's take a brief look at the film situation.

Most 35mm films in general use today have ASA ratings of 100 or so. In my opinion the photographer who wants the best that his lens can give him must use a film with an ASA rating no higher than ASA 30.

There's no point in going into what constitutes proper exposure and development for fine grain films here. Enough has been written in photographic magazines already. It's sufficient right now to say that minimum exposure and development in a proper developer will yield optimum results. Now what resolution can we expect in our final picture? Will it be the combined resolution of both the lens and the film or will it instead be no better than the highest resolution of lens or film? Unfortunately, it's neither. A simple formula (see illustration, below) indicates that the final resolution of lens and film is far less than either the resolution of the lens or the resolution of the film separately.

There has always been a real need for an objective method of determining the image sharpness that a film/developer combination can produce, quite apart from the resolving power of the lens. We don't really talk about a film's graininess or sharpness when we want to talk about resolving power. We use the word "acutance." Acutance is an objective physical measurement of the image sharpness on a developed film. Here's how it's done. A sharp edge, such as a knife blade, is brought into contact with a film and the film is exposed by a single point source of light (such as a xenon arc). The film is then developed and fixed precisely. If you look at the developed film with a magnifying glass, you'll be surprised to find that the sharp blade hasn't left a knife-edge image on the film. Instead, there is a scatter-

LENS AND FILM RESOLUTION FORMULA

$$\frac{1}{R} = \frac{1}{R1} + \frac{1}{Rf}$$

R is final resolution

Rf is resolution in lines/mm of film

R1 is resolution in lines/mm of lens

If lens has resolution of 100 lines/mm

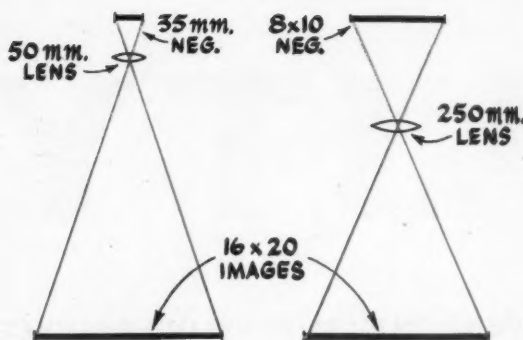
And film has resolution of 100 lines/mm

$$\frac{1}{R} = \frac{1}{100} + \frac{1}{100}$$

$$\frac{1}{R} = \frac{2}{100}$$

$$\frac{1}{R} = \frac{1}{50}$$

R (or final resolution) = 50 lines/mm



WHY AREN'T MY 35MM ENLARGEMENTS SHARP?

Let's say we're enlarging 35mm and 8 x 10 negatives to 16 x 20 on adjacent enlargers. The two negatives will be just about the same height from their respective baseboards assuming we use standard normal focal length enlarging lenses. But the tiny 35mm negative must be enlarged 15X to make a 16 x 20 print while the 8 x 10 negative is only enlarged 2X. So the 35mm enlarger lens must be of infinitely greater resolving power than the 8 x 10 enlarger lens to produce the same quality enlargement.

ing along the line of the knife blade on the film. This is caused by a spread of the light rays within the emulsion. This spread is measurable by a densitometer. Graphs can be plotted comparing the maximum density at the edge where the knife blade was placed, and the spread adjacent to it. A formula using the findings of the graph determines the acutance. The higher the acutance, the better the quality of the film/developer combination. Today's film/developer combinations give far greater acutance than they did even ten years ago. But that, however, is again only part of the problem of overall quality obtainable in the final print or transparency made from 35mm film. So on we go.

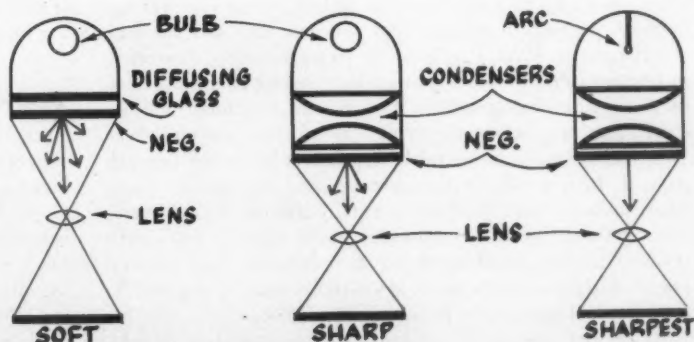
The future in terms of pushing 35mm photography toward that goal of 8 x 10 quality is not up to either lens designers or film manufacturers alone.

If you enlarge a 24 x 36mm negative to approximately 16 x 20 inches, the enlargement from the negative will be about 15 diameters. An 8 x 10 negative need only be enlarged 2 diameters to make the same size print (drawing, page 59.) The human eye sees a picture as satisfactorily sharp if the print resolution is about 10 lines per millimeter. To make the same size print from an 8 x 10 negative, you'd need an enlarging lens with a resolution of 20 lines per millimeter. (There's an elaborate formula which can give you the exact resolution needed in an enlarging lens at any given mag-

nification, taking into account the resolving power of the paper itself. Let's not go into it here.) However, with a 15-diameter enlargement from a 35mm negative, the enlarging lens would theoretically be required to resolve 600 lines per millimeter to give you the same quality as the 8 x 10 negative! Nothing but microfilm today would be suitable for use as the negative material, and the enlarging lens would have to just about equal the Rayleigh limit of resolution. And no lenses for photographic purposes now in use are anywhere near that now—nor will they be in the foreseeable future. If you've ever wondered why the enlarging lens is so important for 35mm work, this should give you the answer.

There are still other factors which further affect the quality of 35mm. Lens, film, shutter vibration all contribute to limiting final resolution on the print itself. The same "image spreading" happens with the 8 x 10 camera, too, but the 8 x 10 negative needs less enlargement to make that 16 x 20 print. When you magnify the 35mm negative 15 diameters or so to compete with the 8 x 10 negative, you also magnify the image spread 15 times while the 8 x 10 negative magnifies it only twice.

Once you get your negative into the enlarger, image spreading takes place on the print. The enlarger shakes. Every enlarger shakes to some extent. Naturally the largest magnification print is most affected. Now the light source of your enlarger comes into play. You do get a sharper image on your print from a condenser enlarger than a diffusion enlarger. And some condenser enlargers with clear bulbs will give you a far sharper image than a condenser enlarger with a frosted bulb. A single point light source such as a xenon arc will produce a sharper print than a clear bulb (see drawing bottom page 59.) But look what happens to picture quality. Your print is sharper but your light source has produced a harsh, (Continued on page 114)



DOES THE ENLARGER AFFECT SHARPNESS? You bet it does. The diffusion enlarger produces a soft, even illumination which has little ability to produce exceedingly sharp enlargements with small negatives since it disperses light. A straight condenser enlarger concentrates the light rays on the negative producing a far sharper print. Dust specks and imperfections, however, show to a greater degree. By substituting a single point light source such as a xenon arc for the bulb, an even sharper image can be had, but this image will be harsh and lacking in roundness.

QUALITY

- 1. WHY QUALITY DOESN'T ALWAYS DEPEND ON FILM/DEVELOPER CHOICE**
- 2. WHEN OVERALL SHARPNESS IS UNIMPORTANT FOR QUALITY "LOOK"**
- 3. WHY YOUR STANDARDS SHOULD BE HIGHER THAN THE JOURNALIST'S**
- 4. WHY THE SUBJECT CONTRAST IS MORE IMPORTANT THAN SHARPNESS**
- 5. HOW LIGHTING WILL AFFECT APPARENT SHARPNESS OF THE PICTURE**
- 6. WHY STANDARDS DIFFER WITH THE TYPE OF SUBJECT AND PURPOSE**
- 7. WHY APPARENT QUALITY IS MORE IMPORTANT THAN REAL QUALITY**

COMPLAINTS ABOUT QUALITY are being fired from all quarters. Everybody's tired of muddy prints, of sloppy focus, of unintentional camera jiggle. And it does seem strange that with today's superior tools—cameras, lenses, films and developers—the actual picture quality is often not up to that obtained by miniature camera users in the 1920's.

Much of this complaint is well founded and is really inexcusable. One of our friends recently said that today's careless photographers are just another case of the overall lowering of standards of craftsmanship in every phase of American life. Someone else blamed the whole thing on progressive education. These wry comments may be debatable. But certain it is that many photographers do not establish standards for themselves, in terms of their own purposes and work.

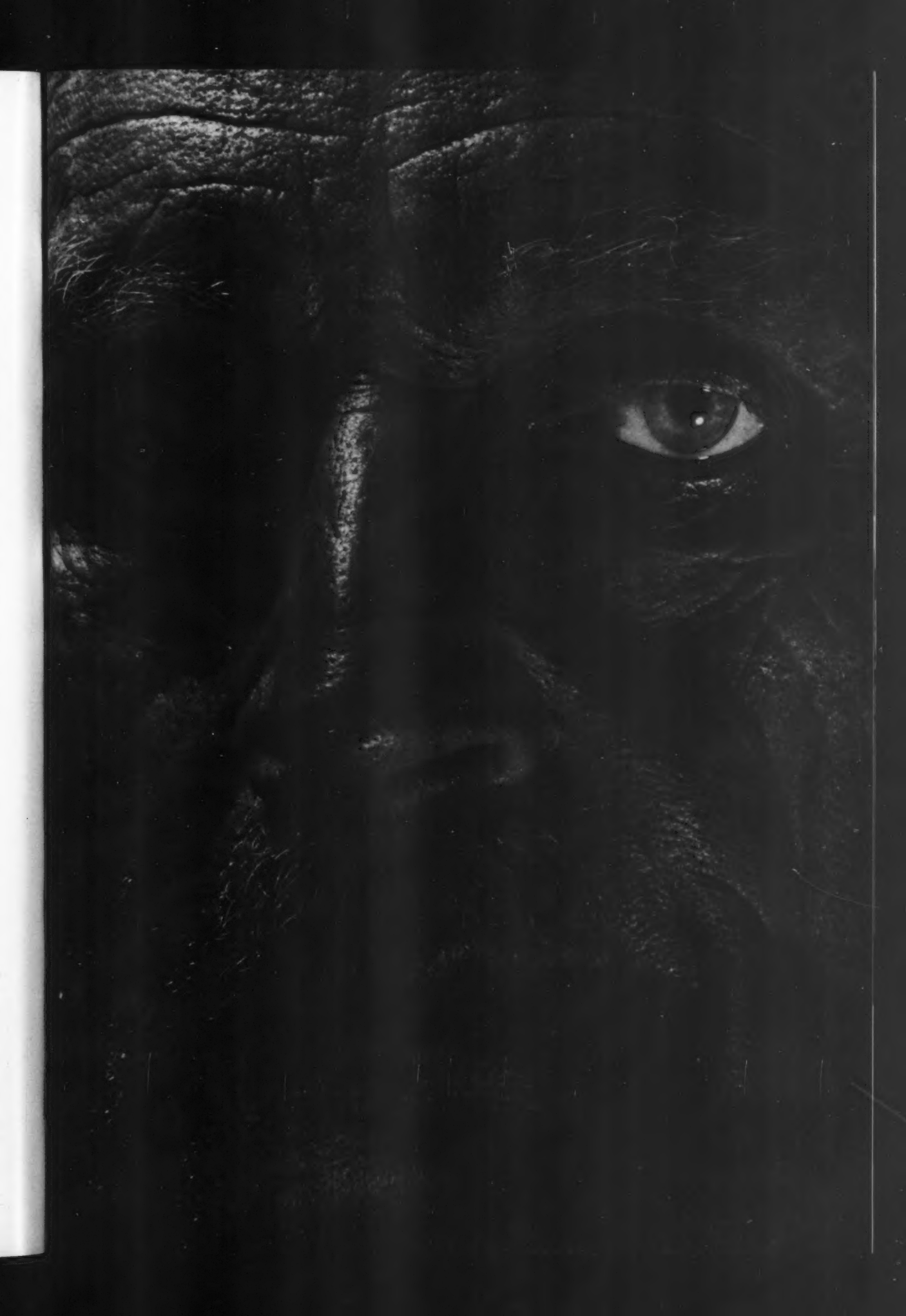
Let's go back for a moment to the early miniature camera users. Most of them had worked with view cameras. They were used to seeing pictures as original prints. Although the first 35mm photographers could no more match prints from large negatives than you can, they did use them as an ideal standard of attainment.

But now, in 1958, it is possible to be seriously interested in photography for years without ever seeing original prints by really fine photographers. You may be interested only in color. You may accept the print from a mass photofinisher. Some people even measure their prints against the printed page in *Life*, *Look*, or the photographic magazines! And, unfortunately, even the finest print by the finest craftsman, when printed in a large-circulation publication, is not a particularly high standard for anyone to hold up as ideal. (Warning: the originals of the pictures which accompany this article are measurably superior to what you see here.)

Along with this cry for higher standards is a great deal of misunderstanding about what quality really is. Let us presume several facts, in our discussion of quality. First that photographs are taken with good cameras and lenses, that the photographer understands how to focus, how to choose the correct film for his picture situation, how to develop the negative for maximum quality, how to enhance the final image by means of careful darkroom work. (All these details have been covered in depth in John Wolbarst's current series of 35mm columns in this magazine.) Let us also presume

SECRET: STEP-BY-STEP CONTROL

Exceptional picture: At right, German photographer Lomont's portrait meets more than one standard of quality. First glance makes you ask, "how did he ever do it?" Further perusal indicates that this shot has not only apparent quality, but very real quality. Lomont had ideal elements to work with. The face was perfect for cross lighting, which picks up texture and details. The assignment was to make a dramatic portrait of a man whose testimony had resulted in conviction of a local "witch"—picture to be called "the watchful eye." Thus, in his printing, Lomont had to go for drama, to heighten the eye. Controls: Lomont had time to pose, focus very sharply, use artificial lights, work on the final print. Data: 2¼ x 3¼ Linhof Technika, 180mm Tele Xenar lens, roll film back, Ilford HP3 film, lens set at f/16, two electronic flash lights for illumination.



QUALITY (cont.)

that we are talking about the final picture's impact, not measuring quality by scientific standards as does C. W. Kendall (see *page 56*). If you have a full range of tones, grainlessness, sharpness where it is necessary within the picture area—then do you meet quality standards?

The answer to this question is not a precise one since each of these criteria is open to qualification. It is possible to come up with a picture which does not meet these standards, but which has an amazing quality "look" about it. At first glance you may say of Antonio Persico's landscape, *page 67*, "Wow, what sharpness!" Look again. Only the foreground two-thirds of the picture is sharp. Moreover, the grain structure is apparent in the background. And, certainly, the range of tones is not sufficient to satisfy an admirer of Edward Weston's work. However, the picture has all the quality it needs to be dramatic and effective.

Thus you can see that every picture which gives the impression of quality needn't fulfill each of the quality criteria to the utmost of technical skill. A rare picture such as Lomont's portrait, *page 61*, does. But we are more concerned with the first glance impression here.

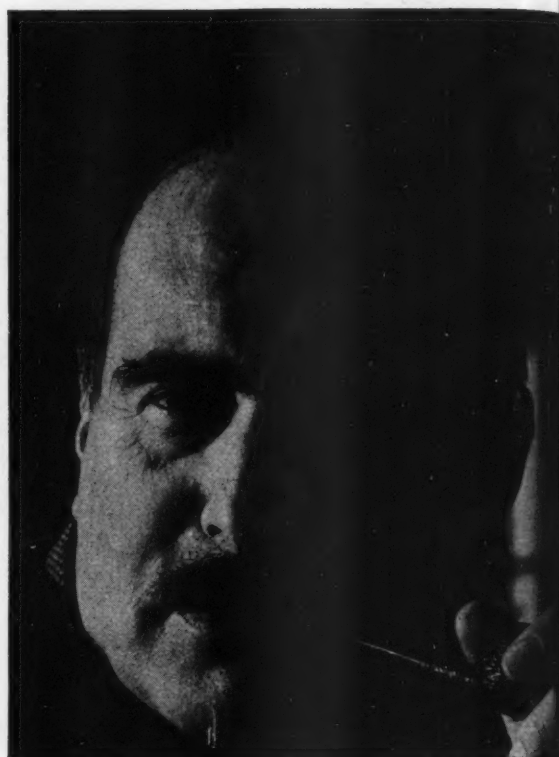
Keeping in mind the difference between technical and apparent quality, let's discuss your own standards—the ideal quality against which you, as a photographer measure your own work. Are you working for a print to hang in a salon? (If so, your standards of technical achievement must be exceedingly high.) Is yours the photo journalist's print-for-reproduction standard? Perhaps you want a snapshot to carry around in your wallet or paste in the family album. Or maybe you are a commercial portrait photographer or an advertising illustrator. For each purpose, there is a different standard, and within each there are variations.

Let's consider the case of the journalist first. He must bring back the best possible picture under any conditions. But the "best" picture possible may often depend on circumstance, and further will vary with the needs and desires of his particular publication. Both the Lisa Larsen portrait, *page 62*, and the one by Lomont, *page 61*, were taken for magazines. But they differ completely—in approach, intent, and in use. Lomont's portrait is an illustration, not a candid news shot. It was taken to illustrate the story idea of a man who had denounced a witch. It was meant to be dramatic, powerful; to illustrate, graphically, the idea of "the watchful eye." Lomont had full control of lighting, and had time to work with his subject.

Larsen's portrait, on the other hand, was not a story illustration, but a news shot. She had a limited period of time to work with her subject, and she was shooting by available light rather than with a studio setup. The standards in this case are entirely different from those which applied to Lomont's picture.

If the journalist applied the same technical standards as the salon photographer, he often wouldn't be fulfilling his function at all. In news photography spontaneity and story telling ability are worth more than grainless 30 x 40 enlargements.

Probably the best reason for the amateur to set a



Portrait of Fred Plaut. By John Wolbarst.

U Nu, Prime Minister of Burma. By Lisa Larsen.





Nigerian watches Queen Elizabeth. By Brian Brake.



My children. By Carroll Seghers II.

4 PICTURES, 4 SUBJECTS, 4 SHOOTING CONDITIONS, 4 SOLUTIONS, 4 STANDARDS

Differing standards of quality depend upon the interrelationship of many factors. Those that we will discuss in terms of these four portraits are: camera size, degree of enlargement, shooting conditions, lighting, the purpose for which the picture was taken, the nature of the subject.

These pictures all have certain obvious characteristics in common. They also have some fairly non-obvious but important dissimilarities.

To the similarities: Wolbarst, Brake, Seghers and Larsen used top quality 35mm cameras and lenses. Each photographer focused fairly well. All worked with available light. The pictures were all taken on location (as opposed to a studio). Not much cropping was done, and the final prints varied from 8 x 10 to 11 x 14.

Now to the differences, each of which affects the final four varying types of quality. First, as to purpose. Wolbarst was testing out a new film. He wanted a lighting which went from highlight to shadow and a subject with enough texture to demonstrate sharpness. He was working for a final print. Brake, Seghers and Larsen were all shooting for magazine reproduction. Their goal was a printed page.

Shooting conditions: Wolbarst was lunching with a friend. He could ask him to turn his head, move his hand, look in this or that direction. Brake was shooting

in a crowd, he could not direct his subject. Seghers was shooting his children. He wanted to show the close relationship between sister and brother, could not pose it, but had to move quickly when it expressed itself. His advantage was in knowing his subjects and having the time to wait for precise moments. Larsen had only a 45-minute interview with U Nu, the Prime Minister of Burma, in his office, and was after an informal, relaxed, candid expression.

Lighting: of great importance in showing apparent quality is the kind of light which the photographer has at his disposal. This is closely connected with the nature of his subject matter. The directional light of the Wolbarst portrait picks up the detail of the individual hairs in the mustache, eyebrows and hair. It emphasizes the roughness and texture of the skin. The three other photographs, while adequately sharp, do not have this pinpoint sharpness effect. They cannot have, because the light is diffused on the faces. There is a certain amount of modeling, but no strong details. It would be pointless to try for this strong cross light in these three cases since the smoothness of the faces is more desirable than texture.

Thus we see that standards of quality vary immensely even when photographers are using similar equipment: cameras, lenses, film and processing materials.

STRONG SUBJECT CONTRAST MAKES PICTURE LOOK SHARP

Strong differences in contrast within the scene can make a picture look sharper than it is. Only front plane of Athens street scene, *below*, is really sharp. Illumination is soft, non-directional (the kind of light you get on a bright hazy day). Yet sickles, cleavers, knives, etc. fairly pop out at viewer. Why? Largely because the whites of the metal are very bright, unlit street stall is very black. The important parts of picture—the tools and the black background—have no middle tones. Figure of man is an accent. Viollon used Leica IIIf, 50mm Elmar, f/3.5, 1/50sec.



Cutler of Athens. By Georges Viollon.

Looking up at tree mushrooms. By Ross Lowell.

USE CROSS LIGHT: IT WILL EMPHASIZE TEXTURE WITHIN MASSIVE FORMS

Large forms, be they mountains in a landscape or mushrooms in a close-up, *below*, need more than mere size if they are to have an appearance of first-glance quality. Even before you focus sharply and for as much depth as possible (necessary details), see if there are details within, which will contrast against the large form. Then choose a lighting to emphasize this texture. If you do this, you will discover that overall sharpness is not necessary. Ross Lowell saw mushrooms growing above him on a tree. He could not get foreground fungi, or those in back, in sunlight. Outer end mushrooms do not look sharp because they are in soft shaded light. Pentacon, 58mm Biotar, 1/100, f/11.



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The happy skater. By Dave Heath.

SOFT LIGHTING CAN BE DIRECTIONAL, ADD TO QUALITY LOOK OF PRINT

Above, directional back light adds roundness, separates figures from background. Even though light is soft, enough overall illumination reflects into dresses to show texture. Interesting fact: soft light gives overall appearance of quality, yet if you look closely at one portion of scene, you won't find that pinpoint sharpness effect which comes from harsh cross light. Compare child's hair (adequately sharp) with mushrooms, *left*. Dave Heath used Nikon S2 camera, 50mm Nikkor lens, Plus-X, f/11, 1/25 sec.

QUALITY (cont.)

higher quality standard than the journalist is that his photographs are meant to be viewed as prints, not as pages in a magazine. The amateur is his own most important critic. He may take pictures for a family album, for salons, or out of some expressive impulse. But if a subject doesn't like a portrait, if a salon judge doesn't award a first, his livelihood is not imperiled, his professional reputation not endangered. An amateur is not working against time as is the news photographer, nor is he so completely dependent on circumstances beyond his control. If the light is bad he can come back another day. If he doesn't like his subject's looks, he can choose not to photograph him at all. He can spend all the time he wishes in the darkroom.

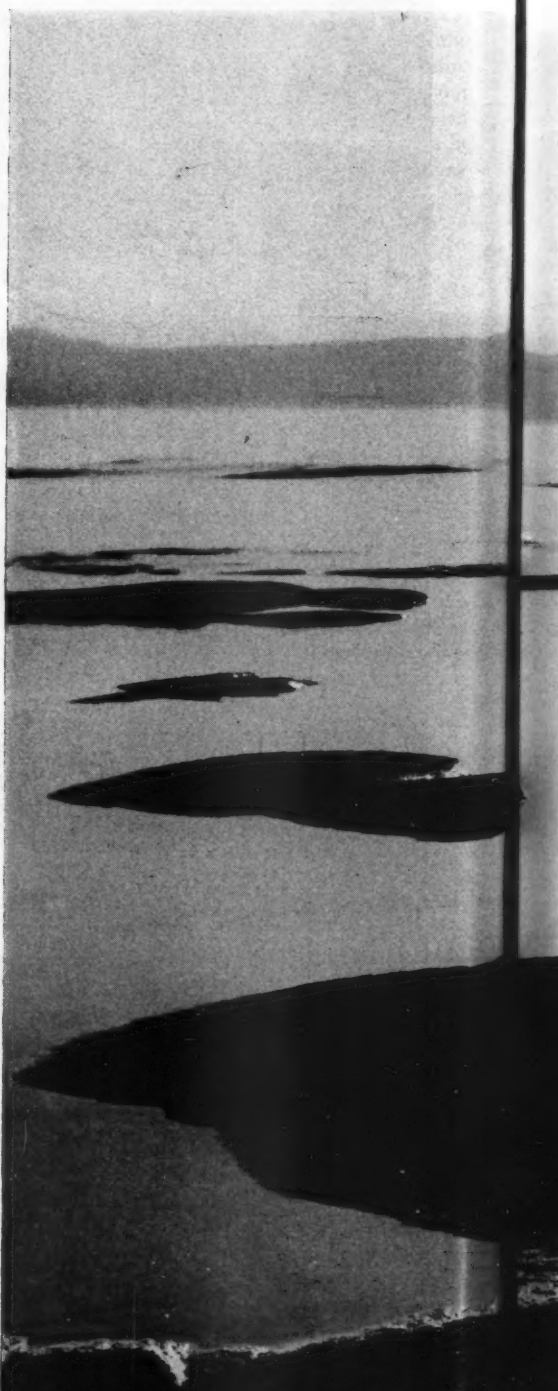
The illustrations accompanying this article will suggest a number of ways for you to get a quality "look." But here are some additional pointers:

1. The apparent quality of a photograph doesn't always depend on film/developer choice. Even relatively high speed 35mm films, when exposed and processed correctly and used in conditions where you can take time to focus carefully and use a sufficiently high shutter speed, can produce 11 x 14 prints which give the impression of excellent quality. No one film/developer combination is best for all types of subject matter. No film can compensate for gross errors in exposure, or for poor shooting techniques. An expert may produce pictures on Tri-X which will be superior in quality to those made by someone else on Adox KB 14.

2. Much of a photographer's control of quality can take place in the darkroom. Both the Lomont portrait, *page 61*, and Dave Heath's playground, *page 65*, are excellent examples. Lomont darkened the subject's right eye in printing; snap and separation of subjects from background in the Heath picture have been emphasized by expert use of ferricyanide.

3. You can't photograph a gray landscape on a gray day, and expect to make a picture which says "quality." The result may be beautiful, delicate and moody; but the impact of contrast will not be there.

4. The amateur has considerably more freedom than the professional both in what and in how he photographs. There are certain types of photographs, certain kinds of subjects, which just cannot be reproduced by large-circulation magazines or newspapers. Because of their delicacy of detail or limited range of tones, these pictures may look beautiful in the original print, but when transferred to the magazine page they completely lose their impact. This limitation is inherent in the process of printing a magazine. It is one which, we believe, should be pointed out to the amateur.—P.C.



YOU CAN HAVE QUALITY WITHOUT OVERALL SHARPNESS!

Behold, an effective black-and-white landscape! First look dictates a reaction of clarity, sharpness, quality. But in the second glance, the viewer notices the faraway hills are soft, grainy. Yet for the effect, the picture was shot to quality standards. A Plaubel Makina with a roll film back was the instrument. The photographer chose to get the first two-thirds of the scene sharp, for the silhouetted bathers are at the outer limit of the sharply focused area. To accomplish his purpose, Persico had the aid of a ground glass, so he knew precisely what he was getting. Other photographers should use their depth of field scales, and stop the lens down. Added pertinent data: Verichrome Pan film, orange filter (to heighten contrast), $f/8$, $1/100$ sec.

Bathers at sunset. By Antonio Persico.





QUALITY IN COLOR

How can you take most advantage of the limitations of latitude in color film?

Is there a single "ideal" color exposure?

Does a picture always look sharp?

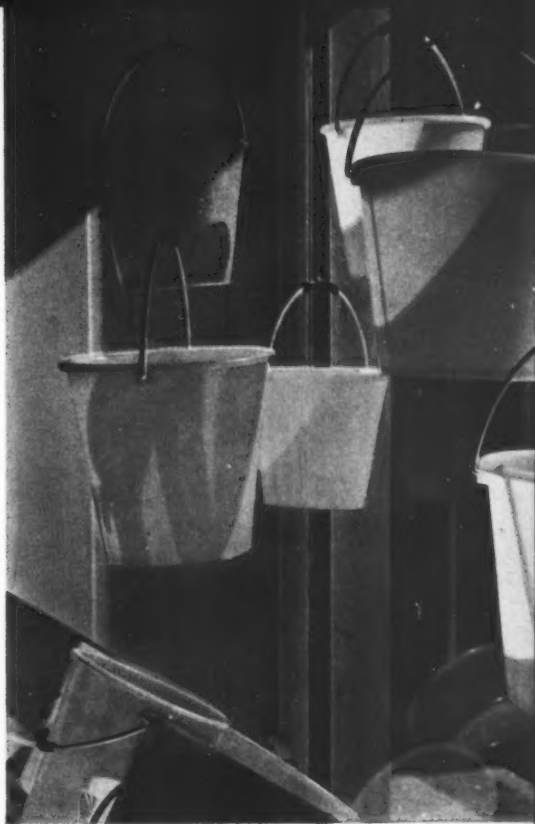
Is there one standard of quality for prints, another for color transparencies?

For details, see text on following page.

◁ Landscape, River Po, Leica, 90mm Elmar, f/8, 1/50.

Milk Pails, Leica, 90mm Elmar, f/11, 1/30.

Milan Exhibition, Leica, 90mm Elmar, f/9, 1/20. ▽



QUALITY IN COLOR

(Continued from page 69)

UNLIKE black-and-white photographers, the color contingent usually is not concerned with film processing. There is no developing to be done, no enlarger, no choice of paper surface to coax along the best possible image. Vital controls for black-and-white, these must be relinquished when you turn to color. Errors in exposure (often capable of compensation in the darkroom with black-and-white) can only be regarded as a total loss in color. Little can be done after exposed film is removed from the camera and posted, hopefully, to the nearest color processor.

A great deal can be exacted, however, during the taking of a picture—in analyzing your subject and its range of tones from darks to lights, in selecting from them the *most important bright area*, and exposing for it. It may be a highlight on a cheek, the glint in an eye, the white of a sail, the sky or, as on *page 69*, the yellow of hung up milk buckets.

As a colleague has said, you may, by firing a shotgun, spray a good deal of shot in the air—and perhaps snag something. Or perhaps not anything at all. Similarly, in exposing color film, you may give an “overall” exposure—and register an acceptable, but hardly outstanding, picture.

The dramatic, almost poster quality of Antonio Persico's Kodachrome work shown here comes partly from his sense of form, of course. But largely it derives from his apparent knowledge of his film and exposure meter, and his skill in putting film latitude and meter readings together. If an esoteric mathematical formula would help, we'd gladly reproduce it here. However, we feel that it's not required. If there's any secret manifesto, it's as short-worded as this: selectivity.

Look at the landscape, *page 68*. Exposure was selected for the sky, and it reproduced pleasingly. Other colors, particularly the foreground reflection are richly saturated. Had exposure been for the foreground the sky would have been considerably washed out, and the scene given an arid, disenchanting quality. Or had it been for the white farmhouse the foreground would have become too dark, perhaps muddy.

Since the sky is important, a suggested method of taking a reading is directly from it. Space stepladders are not required to get your meter as close to the subject as possible! Simply point a reflected light meter directly toward the sky, away from the sun. Use an incident light meter in the usual way, held toward the subject, but pointed to the camera.

As for the milk pails, *page 69*, the yellows were the important bright colors. A meter reading taken close to them indicates the proper exposure.

Ducks, at an exhibition in Milan, *page 69*, are seemingly the point of most interest. However, they are in fact part of a large design which is made up of odd-shaped, lively-colored props against a blue pool back-

ground. You wouldn't expose for whites here because the details in the whites are not that significant to the picture. Furthermore the bright colors would be underexposed. To take a reading from the colored props would be helpful. But when they are out of reach, this is difficult. Thus an average reading, in this case, would seem to be the best solution. Take a reading, with a reflected light meter, from the palm of your hand, keeping it in the same light that falls on the scene.

It so happened that Persico's exposure was made on a sunless day. He calculated $f/9$ and $1/20$ sec. as a basic exposure and, at about eight feet away from the ducks, used an electronic flash fill which extended to about the middle of the scene, as you can see by the two bright spots of light.

Having determined the important part of the subject, then the correct exposure, other requisites for “quality” should be checked. Regardless of most meticulous focusing, will the picture be sharp where it should be sharp? Are you sure? Are there ways you can enhance brisk delineation?

The quality of sharpness, particularly in color, is deceptive. Projected, a transparency may seem to have the clarity of a white gull against the bluest sky. Closely inspected, however, or enlarged and reproduced in a magazine, the apparent sharpness is a deceit. Fine lines become pebbly paths. In the trade we say that color tends to “fall apart” much more than black-and-white when reproduced. A full color magazine reproduction and a color print share another misfortune: light is not transmitted through them to the eye as with a slide viewer or light box. Instead, it is reflected from the surface of print or page giving you a second-hand view. Compared to an original transparency the ordinary reproduction or print loses much in color quality.

Closely scrutinize the light that falls on your subject. Is it directional? If so, can you take advantage of it? Persico's landscape, for example, is lit by the low slanting rays of early morning sun. Persico could have made his photograph from the same direction. His scene would have been bright, and well exposed and probably pleasing enough. But do you visualize what that would lack that this picture has gained? Check his camera angle with the angle of the sun. The result: an *edge light* that gives a dark contrasty rim shadow to the trees and leaves—a shadow that “picks up” the picture and almost makes the leaves flutter! When light is directional, look at your subject from several points of view—not just one. A single shadow may make the difference between an acceptable and an extraordinary picture.

Conceivably, you may want some areas sharp, others unsharp for sake of contrast and dramatic effect. A check on the depth of field scale easily helps solve that. One warning, however, for color work: avoid using a lens at widest aperture, which might cause a fall-off of definition at the edges of the picture.

Surrender of the darkroom's black-and-white controls by no means leaves you, the color photographer, without arms! These are your controls. They may be more demanding. But they'll make you more selective and discerning—D. J.

1958

INTERCHANGABLE

LENS

LIST

HOW TO USE LENS LIST

The code letters opposite your camera's name (*below*) are the key to the selection of lenses which will fit it. You'll note that a number of cameras share the same code, indicating that they will accept the same lenses. For example, threaded Canon and Leica lenses (LC) will fit the same lens mounts.

Contax and Nikon lenses may be interchanged with good success, too, up to 50mm. In focal lengths of 85mm and longer, differences in back focus, absorbed by the greater depth of focus in shorter lenses, make themselves felt. Nikon, Inc. makes a special set of Nikkor lenses that couple to Contax cameras.

Preset Exakta and Topcon R lenses may be used interchangeably.

Automatic Exakta lenses cannot be used for automatic operation on Topcon R or on Miranda cameras with adapter due to difference in location of release button. For the same reason Topcon R lenses can't be used for automatic operation on Exakta and Miranda cameras.

Automatic lenses listed for the Edixa reflex will also operate on similarly threaded cameras (such as Pentacon F and FB, Bentaconic and Ritacon F) which have built-in release mechanism. They will operate as manual diaphragm lenses with all other cameras marked "PC."

When you do buy a new lens, remember that minor variations in flange and camera thickness can affect maximum definition. For best results the camera's manufacturer, or a competent local camera repair shop, should check the adjustment to make sure the lens is tracking and coupling properly. It's a good idea to have all your lenses "zeroed in" at the same time. Prices, as listed here, are approximate.

Agfa Ambi-Silette	AM
Akarex III	AK
Alpa Reflex 4, 5, 6, 7	AL
Argus C3	AR
Argus C4	AG
Argus C44	AS
Argus Match-Matic	AR
Asahiflex	AH
Asahi Pentax	PC
Astra 35	PC
Astraflex 35	PC
Astraflex II	AX
Bentaconic	PC
Braun 35, Super IIL and IIBL	BR
Braun Automatic Super III	BA
Canon	LC

Catalina Reflex	PC
Columbia	PC
Consol	PC
Contaflex Alpha, Beta	CA
Contaflex III, IV	CO
Contax IIa, IIIa	CX
Contax D, S	PC
Contina III	CN
Corbina	PK
DeJUR DI	DI
DeJUR D3	DJ
Diax	DX
Edixa Reflex	PC
Exa	EX
Exakta	EX
Exakta 66	ES
Futura IIIs	FU
Gamma	LC
Grantflex	PC
Hasselblad 500C	HC
Hasselblad 1000F	HA
Hasselblad Superwide	HS
Hexacon	PC
Hexacon Supreme	PK
Kalimar Reflex	KA
Korelle Reflex	KR
Leica	LC
Leica M3	LM
Leotax	LC
Lordomat	LO
Lordomat C35	LO
Master Reflex	MR
Melcon	LC
Minolta Super A	MA
Miranda (with proper adapter)	EX-PC
(close-ups only)	NI-CX-LC
Miranda (for camera's own thread mount)	MI
Miranda (for camera's own outer bayonet mount)	MO
Nicca	LC
Nikon	NI
Peerflex	AX
Peerless	LC
Pentacon	PC
Praktica	PC
Praktiflex	PC
Praktina	PK
Primar Reflex	AX
Prominent	PT
Rectaflex	RF
Reflex 66	RX
Requa IIId	RG
Retina IIc, IIId, IIIC	RE
Retina Reflex	RE
Ritacon	PC
Rival Reflex	PC
Robot Jr. II, IIa, III, Star	RS
Robot Royal 24	RR
Robot Royal 36	RO
Soligor 66 Reflex	KA
Super D	PC
Tanack	LC
Topcon R	TR
Tower	LC
Verikon	PC
Vitessa T	VT
Wittnauer	WI

21mm f/4.5 Biogon. Zeiss Stuttgart, Germany. CX-NI, \$199

25mm f/4 Nikkor. Nippon Kogaku, Japan. LC-NI-CX, \$169.50

25mm f/3.5 Canon. Canon Camera Co., Japan. LC, \$165

28mm f/5.6 Summaron. Leitz, Germany. LC, \$108; LM (with adapter), \$118.50

28mm f/3.5 Canon. Canon Camera Co., Japan. LC, \$135

28mm f/3.5 Nikkor. Nippon Kogaku, Japan. NI-CX-LC, \$149.50

28mm f/3.5 Retrofocus Type II. Angenieux, France. Preset diaphragm, AL, \$139; EX-PC-PK-TR, \$120; non-preset, LC, \$120

28mm f/3.5 Ultra-Lithagon. Enna Werk, Germany. RG, \$99.50

28mm f/2.8 Canon. Canon Camera Co., Japan. LC, \$149.50

30mm f/4 Pantar. Zeiss Stuttgart, Germany. Lens component, CA-CN, \$69

30mm f/3.5 Xenagon. Schneider, Germany. RR-RS, \$89

30mm f/2.8 Eurygon. Rodenstock, Germany. PC, \$89.50

35mm f/5.6 Curtar. Schneider, Germany. Lens component (not recommended for Retina Reflex), RE, \$55

35mm f/4.5 Ampligon. Futura Camera Co., Germany. FU, \$66.50

35mm f/4.5 Argus Cintagon. Steinheil, Germany. AS, \$56.50

35mm f/4.5 Argus Sandmar. Enna Werk, Germany. AR, \$49.50. Also fits Argus 21 with adapter.

35mm f/4.5 Lithagon. Enna Werk, Germany. Preset diaphragm, EX-TR, \$64.45; AG (requires installation of interchangeable lens mount by Geiss-America), \$57.50, plus \$10 mount installation

35mm f/4.5 Primagon. Hugo Meyer, Germany. Preset diaphragm, EX-PC-PK-TR, \$59.50

35mm f/4.5 Wittnauer. Rodenstock, Germany. WI, \$71.50

35mm f/4 Color-Ambion. Agfa, Germany. AM, \$68

35mm f/4 Curtar. Schneider, Germany. Lens component, RE, \$72.50

35mm f/4 Pro-Tessar. Zeiss Stuttgart, Germany. Lens component, CO, \$89

35mm f/4 Radiogon. Schneider, Germany. Preset diaphragm, PC-EX-TR, \$74.50

35mm f/3.5 Accurar. Photographic Importing and Distributing Corp., Japan. Preset diaphragm, PC-EX-TR, \$69.95; non-preset, LC, \$66.95

35mm f/3.5 Alpagon. Schacht, Germany. Automatic diaphragm, AL, \$109

35mm f/3.5 Komura. Komura, Japan. Preset diaphragm, EX-PC-TR, price to be announced

35mm f/3.5 Klaroptik. A-G Photo Distributors, Japan. LC, \$49.50; LM, \$59.50

35mm f/3.5 Lithagon. Enna Werk, Germany. RG, \$59.95; BA, \$69.50

35mm f/3.5 Nikkor. Nippon Kogaku, Japan. **NI-CX**, \$89.50

35mm f/3.5 Optinar. Optical Importing and Exporting Corp., Japan. Preset diaphragm, **EX-PC-TR**, \$99.50

35mm f/3.5 Planar. Zeiss Stuttgart, Germany. **CX-NI**, \$102

35mm f/3.5 "RF" Summaron. Leitz, Germany. **LM**, \$139.50

35mm f/3.5 Spectra. Aetna-Optix, Japan. Preset diaphragm, **EX-PC-TR**, \$59.50

35mm f/2.5 Rokkor. Minolta, Japan. **MA**, \$59.50

35mm f/3.5 Retar. Scopus Brockway, Japan. Preset diaphragm, **EX-PC-TR**, \$79.95

35mm f/3.5 Skoparon. Voigtlander, Germany. **PT**, \$99.50

35mm f/3.5 Soligor. Allied Impex, Japan. **PC-EX-TR**, \$74.50; non preset, **CX-LC-NI**, \$64.95; **AR**, \$44.95; preset diaphragm, **MI**, \$74.50

35mm f/3.5 Special Travenar. Schacht, Germany. **LO**, \$59.50

35mm f/3.5 Summaron. Leitz, Germany. **LC**, \$105; **LM** (with adapter), \$115.50

35mm f/3.5 Travegon. Schacht, Germany. Automatic diaphragm, **PC-EX**, \$99.50

35mm f/3.5 Westron. Isco, Germany. **BR**, \$47.95; **DX**, \$49.50

35mm f/3.5 Xenagon. Schneider, Germany. (Complete with own coupled rangefinder) **AK**, \$79.50

35mm f/3.4 Skoparet. Voigtlander, Germany. **VT**, \$79.50

35mm f/2.8 Auto Quinaron. Steinheil, Germany. Automatic diaphragm, **EX**, \$149.50

35mm f/2.8 Auto-Topcor. Tokyo Optical Co., Japan. Automatic diaphragm, **TR**, \$139.95

35mm f/2.8 Biogon. Zeiss Stuttgart, Germany. **CX-NI**, \$166

35mm f/2.8 Canon. Canon Camera Co., Japan. **LC**, \$105

35mm f/2.8 Curtagon. Schneider, Germany. Automatic diaphragm, **EX-PK**, \$149.50; **PC**, \$119.50

35mm f/2.8 Flektagon. Zeiss Jena, Germany. Automatic diaphragm, **EX-PK**, \$149.50

35mm f/2.8 Komura. Komura, Japan. Preset diaphragm, **EX-PC-TR**, price to be announced

35mm f/2.8 Tanar. Kine Camera Co., Japan. **CX-LC-NI**, \$79.50

35mm f/2.8 Votar. Piesker, Germany. Preset diaphragm, **AH-AL-EX-PC-PK-RF**, \$75

35mm f/2.8 Xenogon. Schneider, Germany. **LC**, \$89.95; **RO-RR**, \$119

35mm f/2.5 Accurar. Photographic Importing and Distributing Corp., Japan. Preset diaphragm, **PC-EX-LC-TR**, \$79.95

35mm f/2.5 Nikkor. Nippon Kogaku, Japan. **NI-CX**, \$139.50

35mm f/2.5 Optinar. Optical Importing and Exporting Corp., Japan. Preset diaphragm, **EX-PC-TR**, \$120

35mm f/2.5 Retrofocus Type 1. Angenieux, France. Preset diaphragm, **EX-TR**, \$99.50; non-preset, **LC**, \$99.50

35mm f/2.5 Rotar. Scopus Brockway, Japan. Preset diaphragm, **EX-PC-TR**, \$99.95

35mm f/2.5 Spectra. Aetna-Optix, Japan. Preset diaphragm, **EX-LC-PC-TR**, \$79.50

35mm f/2.5 Super-Lithagon. Enna Werk, Germany. Preset diaphragm, **EX-TR**, \$99.50

35mm f/1.9 Zunow. Zunow, Japan. **LC-CX-NI**, \$100

35mm f/1.8 Canon. Canon Camera Co., Japan. **LC**, \$149.50

35mm f/1.8 Nikkor. Nippon Kogaku, Japan. **NI-CX**, \$179.50

38mm f/4.5 Biogon. Zeiss Stuttgart, Germany. **HS**, \$470.25

38mm f/3.5 Choro. Braun, Germany. **BR**, \$29.95

38mm f/3.5 Dr. Staebels. DeJur-Amsco, Germany. **DI**, \$25

38mm f/3.5 Radionar. Schneider, Germany. **RS**, \$59

38mm f/2.8 Xenar. Schneider, Germany. **RR-RS**, \$79

40mm f/4.5 Helioplan. Hugo Meyer, Germany. **EX-TR**, \$54.50

40mm f/4.5 Isogon. Schneider, Germany. **PC-EX-TR**, \$54.95

40mm f/3.5 Cassaron. Steinheil, Germany. **EX-PC-PK-TR**, \$54.50

40mm f/3.5 Makro-Kilar D. Kilfitt, Liechtenstein. **AL-EX-PC-RF-TR**, \$114.95; preset diaphragm, **AL**, \$124

40mm f/3.5 Makro-Kilar E. Kilfitt, Liechtenstein. **AL-EX-PC-RF-TR**, \$89.95; preset diaphragm, **AL**, \$99

40mm f/3.5 Tessar. Zeiss Jena, Germany. **PC**, \$85

40mm f/3.5 Xenagon. Schneider, Germany. **DX**, \$69.50

40mm f/2.8 Makro-Kilar D. Kilfitt, Liechtenstein. Preset diaphragm, **AL-EX-PC-RF-TR**, \$139.50

40mm f/2.8 Makro-Kilar E. Kilfitt, Liechtenstein. Preset diaphragm, **AL-EX-PC-RF-TR**, \$119.50

40mm f/1.9 Xenon. Schneider, Germany. **RR**, \$109; **RS**, \$99

45mm f/2.8 Xenar. Schneider, Germany. **RO-RR**, \$79

45mm f/1.9 Lithagon. Enna Werk, Germany. **AS**, \$99.50; **AG** (requires installation of interchangeable lens mount by Geiss-America), \$99.50, plus \$10 mount installation.

50mm f/3.5 Alorar. Karl Heitz, Switzerland. **AL**, \$49

50mm f/3.5 CBSTAR. CBS Laboratories, U.S.A. In special focusing mounts for various 35mm single-lens reflexes, reflex housings, copying attachments. Focusing range, infinity to 1:1.7 ratio, \$75

50mm f/3.5 Cintar. Argus, U.S.A. **AR**, \$30.50

50mm f/3.5 Elmar. Leitz, Germany. **LC**, \$58.50; **LM** (with adapter), \$69; **LM** only, \$66

50mm f/3.5 Isconar. Isco, Germany. **DX**, \$29.50

50mm f/3.5 Micro Nikkor. Nippon Kogaku, Japan. **LC-NI-CX**, \$199.50

50mm f/3.5 Primotar. Hugo Meyer, Germany. Automatic diaphragm, f/2.8 focusing aperture, **EX**, \$79.50

50mm f/3.5 Takumar. Asahi Optical Co., Japan. **AH-PC-PK**, price to be announced.

50mm f/3.5 Tessar. Zeiss Stuttgart, Germany. **CX-NI**, \$68

50mm f/3.5 Westar. Isco, Germany. **DX**, \$19.50

50mm f/3.5 Xenar. Schneider, Germany. **PC**, \$54.95

50mm f/2.8 Alfinon. Karl Heitz, Switzerland. Preset diaphragm, **AL**, \$89

50mm f/2.8 Canon. Canon Camera Co., Japan. **LC**, \$69.50

50mm f/2.8 Cintagon. Argus, U.S.A. **AS**, \$89.50

50mm f/2.8 Color Solinar. Agfa, Germany. **AM**, \$47

50mm f/2.8 Elmar. Leitz, Germany. **LC**, \$87; **LM** (with adapter), \$97.50

50mm f/2.8 R Topcor. Tokyo Optical Co., Japan. Preset diaphragm, **EX-TR**, price to be announced

50mm f/2.8 Tessar. Zeiss Jena, Germany. Automatic diaphragm, **EX-PK-TR**, \$100; **PC**, \$90; Preset diaphragm, **PC**, \$59

50mm f/2.8 Travenar. Schacht, Germany. Preset diaphragm, **PC-EX-TR**, \$69.95; **PK-RF**, \$73

50mm f/2.8 Westanar. Isco, Germany. Automatic diaphragm, **EX**, \$69.50; **PC**, \$60

50mm f/2.8 Xenar. Schneider, Germany. **DX**, \$44.50; **EX-PC-TR**, \$64.95

50mm f/2 Dual-Range Summicron. Leitz, Germany. **LM** only, \$198.50

50mm f/2 Nikkor. Nippon Kogaku, Japan. **NI-CX**, \$106; **LC**, \$135

50mm f/2 Rokkor. Minolta, Japan. **MA**, \$59.50

50mm f/2 Sonnar. Zeiss Stuttgart, Germany. **CX-NI**, \$119; **RO-RR**, \$149

50mm f/2 Summicron. Leitz, Germany. Collapsible mount, **LC**, \$156; **LM** (with adapter), \$166.50; **LM** only (rigid mount), \$159

50mm f/2 Westagon. Isco, Germany. Automatic diaphragm, **EX**, \$110; **PC**, \$90

50mm f/2 Xenon. Schneider, Germany. **DX**, \$74.50

50mm f/1.9 Cintagon. Argus, Germany. **AS**, \$89.50

50mm f/1.9 Miranda Soligor. Allied Impex, Japan. Automatic diaphragm, **MO**, \$89.95; preset diaphragm, **MI**, \$59.95

50mm f/1.9 Xenon. Schneider, Germany. Automatic diaphragm, **AL**, \$169; **EX-PK**, \$179.50; **PC**, \$169.95

50mm f/1.8 Canon. Canon Camera Co., Japan. **LC**, \$110

50mm f/1.8 Rokkor. Minolta, Japan. **MA**, \$75.50

50mm f/1.8 Switar Apochromat. Kern, Switzerland. Automatic diaphragm, **AL**, \$199

50mm f/15 Angenieux. Angenieux, France. Preset diaphragm, **EX-TR**, \$165; non-preset, **LC**, \$135

50mm f/1.5 Canon. Canon Camera Co., Japan. LC, \$139.50

50mm f/1.5 Sonnar. Zeiss Stuttgart, Germany. CX-NI, \$139

50mm f/1.5 Summarit. Leitz, Germany. LC, \$195; LM (with adapter), \$205.50; LM only, \$198

50mm f/1.4 Nikkor. Nippon Kogaku, Japan. NI-CX, \$151.50; LC, \$189.50

50mm f/1.2 Canon. Canon Camera Co., Japan. LC, \$210

50mm f/1.1 Nikkor. Nippon Kogaku, Japan. NI-CX, \$299.50; LC, \$315

50mm f/1.1 Zunow. Zunow, Japan. LC-CX-NI, \$300

52mm f/3.5 Kaligar. Kalimar, Inc., Japan. Preset diaphragm, KA, \$99.50

52mm f/3.5 Soligor. Allied Impex, Japan. KA, price to be announced.

55mm f/2.2 Takumar. Asahi Optical Co., Japan. Preset diaphragm, AH-PC, \$65.05

55mm f/1.9 Auto-Quinon. Steinheil, Germany. Automatic diaphragm, EX, \$169.50; PK, \$160

58mm f/2 Auto Biotar. Zeiss Jena, Germany. Automatic diaphragm, EX, \$162.80; PK, \$158

58mm f/1.8 Auto-Topcor. Tokyo Optical Co., Japan. Automatic diaphragm, TR, \$139.95

58mm f/2 Takumar. Asahi Optical Co., Japan. Preset diaphragm, AH-PC-P, price to be announced.

58mm f/1.9 Primoplan. Hugo Meyer, Germany. Preset diaphragm, PC, \$59

59mm f/3.5 Repro-Skopar. Voigtlander, Germany. Incorporated in copying device, PT, \$139.50 for complete outfit.

60mm f/5.6 Distagon. Zeiss Stuttgart, Germany. Preset diaphragm, HA, \$189.50; LVS Compur shutter and automatic diaphragm, HC, \$312.50

60mm f/1.2 Hexanon. Konica Camera Co., Japan. LC, \$359.50

75mm f/4 Pantar. Zeiss Stuttgart, Germany. Lens component, CA-CN, \$71

75mm f/4 Tele-Xenar. Schneider, Germany. RO-RR, \$109; RS, \$99

75mm f/3.8 Futar Telephoto. Futura Camera Co., Germany. FU, \$82.50

75mm f/3.5 Xenar. Schneider, Germany. Preset diaphragm, AL, \$109

75mm f/1.9 Primoplan. Hugo Meyer, Germany. Preset diaphragm, EX-PK-TR, \$135

75mm f/1.5 Biotar. Zeiss Jena, Germany. Preset diaphragm, EX-PK-TR, \$216.50

80mm f/4 Longar. Schneider, Germany. Lens component, RE, \$75

80mm f/3.5 Komura. Komura, Japan. Preset diaphragm, EX-PC-TR, price to be announced.

80mm f/3.5 Primotar. Hugo Meyer, Germany. EX-TR, \$69.50

80mm f/2.8 Biometar. Zeiss Jena, Germany. Preset diaphragm, PK, \$120

80mm f/2.8 Planar. Zeiss Stuttgart, Germany. LVS Compur shutter and automatic diaphragm, **HC**, \$261.50

80mm f/2.8 Tessar. Zeiss Jena, Germany. Preset diaphragm, **EX-TR**, \$79.50; **HA**, \$170.50

80mm f/2.8 Tessar. Zeiss Stuttgart, Germany. Preset diaphragm, **HA**, \$170.50

80mm f/2 Xenon. Schneider, Germany. **AL**, \$129; **PC**, \$159.95

83mm f/1.9 Takumar. Asahi Optical Co., Japan. **AH-PC**, \$129

85mm f/5.6 Dr. Staebels. DeJur-Amsco, Germany. **DI**, \$25; **DJ**, price to be announced.

85mm f/4.5 Isconar. Isco, Germany, **DX**, \$49.50

85mm f/4 Pro-Tessar. Zeiss Stuttgart, Germany. Lens component, **CO**, \$99

85mm f/4 Triotar. Zeiss Stuttgart, Germany. **CX**, \$106

85mm f/4 Wittnauer. Rodenstock, Germany. **WI**, \$82.50

85mm f/3.8 Tele Quinar. Steinheil, Germany. **BR**, \$59.95

85mm f/3.5 Quinon. Steinheil, Germany. **BR**, \$59.95

85mm f/2.8 Culminar. Steinheil, Germany. **EX-PC-TR**, \$69.50; **LC**, \$84.50

85mm f/2.8 Rokkor. Minolta, Japan. **MA**, \$99.50

85mm f/2.8 Travenar. Schacht, Germany. Preset diaphragm, **EX-PC-TR**, \$93.95; **PK-RF**, \$97; non-preset, **LC**, \$89.95

85mm f/2 Nikkor. Nippon Kogaku, Japan. **NI-CX-LC**, \$175

85mm f/2 Sonnar. Zeiss Stuttgart, Germany. **CX**, \$189

85mm f/2 Astragon. Sterling-Howard, Germany. Preset diaphragm, **AX-EX-MR-PC-KR-TR**, \$74.95

85mm f/1.9 Canon. Canon Camera Co., Japan. **LC**, \$169.50

85mm f/1.5 Canon. Canon Camera Co., Japan. **LC**, \$235

85mm f/1.5 Lithagon. Enna Werk, Germany. **LC**, \$199.50

85mm f/1.5 Nikkor. Nippon Kogaku, Japan. **NI-CX-LC**, \$299.50

85mm f/1.5 Summarex. Leitz, Germany. **LC**, \$360; **LM** (with adapter), \$370.50

90mm f/5.6 Tele-Elor. Futura Camera Co., Germany. **FU**, \$99.50

90mm f/4 Color Telinear. Agfa, Germany. **AM**, \$79

90mm f/4 Elmar. Leitz, Germany. **LC**, \$96; **LM** (with adapter), \$106.50; **LM** only (in rigid non-rotating mount), \$99; **LM** only (in collapsible mount), \$156

90mm f/4 Tele-Arton. Schneider, Germany. **RR**, \$119

90mm f/4 Special Travenar. Schacht, Germany. **LO**, \$69.50

90mm f/3.5 Tele-Ennalyt. Enna Werk, Germany. **BA-RG**, \$69.50

90mm f/3.5 Tele-Xenar. Schneider, Germany. **AK** (complete with own coupled rangefinder), \$89.95; preset diaphragm, **AL**, \$129; **EX-PC-TR**, \$74.50; non-preset **DX**, \$79.50

90mm f/3.5 R Topcor. Tokyo Optical Co., Japan. Preset diaphragm, **EX-TR**, price to be announced.

90mm f/2.8 Altelar. Schacht, Germany. Preset diaphragm, **AL**, \$139

90mm f/2.8 Makro-Kilar. Kilfitt, Germany. Basic lens, \$249.95; in mount for **HA**, \$249.95; adapters for **EX-LC-PC-TR**, \$12; for **AL-RF**, \$16.50; **HA**, \$20

90mm f/2.5 Angenieux Type Y1. Angenieux, France. **EX-LC-TR**, \$94.50

90mm f/2 Summicron. Leitz, Germany. **LC**, \$259.50 **LM**, \$262.50

90mm f/1.8 Angenieux Type P1. Angenieux, France. **EX-TR**, \$149.50

100mm f/5.5 Telomar. Voigtlander, Germany. Complete with reflex housing, **PT**, \$159.50

100mm f/4.8 Dynaret. Voigtlander, Germany. **VT**, \$79.50

100mm f/4.5 Dynaron. Voigtlander, Germany. **PT**, \$89.50

100mm f/4.5 Isconar. Isco, Germany. **EX-TR**, \$25

100mm f/4.5 Lithagon. Enna Werk, Germany. **AG** (requires installation of interchangeable lens mount by Geiss-America), \$59.50, plus \$10 mount installation.

100mm f/4.5 Sandmar. Enna Werk, Germany. **AR**, \$49.50

100mm f/3.5 Canon. Canon Camera Co., Japan. **LC**, \$110

100mm f/3.5 Cintagon. Steinheil, Germany. **AS**, \$59.50

100mm f/3.5 Takumar. Asahi Optical Co., Japan. **AH-PC**, \$79.50

100mm f/2.8 Auto-Topcor. Tokyo Optical Co., Japan. Automatic diaphragm, **TR**, price to be announced.

100mm f/2.8 Astragon. Sterling-Howard. Preset diaphragm, **AX-EX-HA-MR-PC-KR-TR**, \$44.50

100mm f/2.8 Tele-Votar. Piesker, Germany. Preset diaphragm, basic lens, \$59.50; adapters for **AL-AH-EX-HA-PC-MR-AX-KA-KR-PK-RF-TR**, \$11.85; for **LC-NI-CX** (uncoupled), \$11.85

100mm f/2.8 Trioplan. Hugo Meyer, Germany. Preset diaphragm, **EX-PK-TR**, \$59.50

100mm f/2 Alpa Apochromat. Kinoptik, France. Preset diaphragm; **AL**, \$299

105mm f/4.5 Xenar. Schneider, Germany. **EX-PC-TR**, \$69.95

105mm f/3.5 Komura. Komura, Japan. Preset diaphragm, **EX-PC**, price to be announced

105mm f/3.5 Xenar. Schneider, Germany. **PC**, \$79.95

105mm f/2.5 Nikkor. Nippon Kogaku, Japan. **NI-CX-LC**, \$152.50

115mm f/3.5 Panflex Tessar. Zeiss Stuttgart, Germany. Automatic diaphragm. For use with Panflex Reflex Housing, **CX**, \$179

120mm f/2.5 Imagon. Rodenstock, Germany. Special diffused focus, **EX-HA-PC-PK-LC-TR**; LC model requires reflex housing, \$134.50

125mm f/2.5 Hektor. Leitz, Germany. **LC-LM** (require reflex housing such as Visoflex), \$157.50

125mm f/2.5 Telagon. Tewe, Germany. **AH-AL-EX-PC-PK-RF-TR**, \$150

135mm f/4.5 Culminar. Steinheil, Germany. **EX-PC-TR**, \$69.50; **LC**, \$75

135mm f/4.5 Hektor. Leitz, Germany. **LC**, \$139.50; **LM** (with adapter), \$150; **LM** only, \$141; in short mount for use with Visoflex reflex housing, \$123

135mm f/4.5 Rokkor. Minolta, Japan. **MA**, \$99.50

135mm f/4.5 Rotar. Scopus Brockway, Japan. **EX-PC-TR**, \$37.95

135mm f/4.5 Soligor. Allied Impex, Japan. **AR**, \$49.95

135mm f/4.5 Telisar. Masel Co., Germany. **EX-PC-TR**, \$39.95

135mm f/4.5 Travenon. Schacht, Germany. **EX-PC-TR**, \$49.95; **PK-RF**, \$53; **LC**, \$59.95

135mm f/4.5 Will-Colinar. Spiratone, Germany. In short mount for use with bellows, reflex housings, \$24.95

135mm f/4.5 Xenar. Schneider, Germany. **EX-TR**, \$84.95

135mm f/4 Special Travenar. Schacht, Germany. **LO**, \$99.50

135mm f/4 Super Dynaret. Voigtlander, Germany. **VT**, \$89.50

135mm f/4 Tele-Xenar. Schneider, Germany. **DX**, \$89.50; **RR**, \$149

135mm f/4 Triotar. Zeiss Jena, Germany. Preset diaphragm, **EX-PC-PK-TR**, \$85

135mm f/4 Wittnauer. Rodenstock, Germany. **WI**, \$109.50

135mm f/3.8 Tele-Colinar. Arco, Japan. **LC**, \$66.95

135mm f/3.5 Accurar. Photographic Importing and Distributing Corp., Japan. Preset diaphragm, **EX-PC-TR**, \$69.95; non-preset, **LC**, \$66.95

135mm f/3.5 Astra. Sterling-Howard, Japan. Preset diaphragm, **EX-PC-TR**, \$33.75; non-preset, **LC**, \$48.95; **LM**, \$56.90

135mm f/3.5 Auto-Topcor. Tokyo Optical Co., Japan. Automatic diaphragm, **TR**, price to be announced

135mm f/3.5 Canon. Canon Camera Co., Japan. **LC**, \$125

135mm f/3.5 Ektar. Kodak, U.S.A. Preset diaphragm, **HA**, \$279.50

135mm f/3.5 Ennaston. Enna Werk, Germany. **BR**, \$69.95

135mm f/3.5 Jupien. Gem-Klein, Japan. Preset diaphragm, **EX-PC-TR**, \$59.95

135mm f/3.5 Klaroptik. A. G. Photo Distributors, Japan. **LC**, \$49.50; **LM**, \$59.50

135mm f/3.5 Komura. Komura, Japan. Preset diaphragm, **EX-PC**, price to be announced

135mm f/3.5 Lithagon. Enna Werk, Germany. AG (requires installation of interchangeable lens mount by Geiss-America), \$99.50, plus \$10 mount installation

135mm f/3.5 Nikkor. Nippon Kogaku, Japan. NI-CX-EX-LC-TR, \$135

135mm f/3.5 Primotar. Hugo Meyer, Germany. Preset diaphragm, EX-PC-PK-TR, \$89.50; ES, \$99.50

135mm f/3.5 Rotar. Scopus Brockway, Japan. Preset diaphragm, EX-PC-TR, \$65

135mm f/3.5 Soligor. Allied Impex, Japan. Preset diaphragm, EX-PC-TR, \$59.95; non-preset, LC-CX-NI, \$69.95; preset diaphragm, MI, \$59.50

135mm f/3.5 Sonnar. Zeiss Stuttgart, Germany. CX, \$164

135mm f/3.5 Spectra. Aetna-Optix, Japan. Preset diaphragm, EX-LC-PC-TR, \$49.50

135mm f/3.5 Takumar. Asahi Optical Co., Japan. Preset diaphragm, AH-PC, \$89.50

135mm f/3.5 Tele-Ennalyt. Enna Werk, Germany. RG, \$89.50; BA, \$74.50; BR, \$69.95; PC, \$59.50

135mm f/3.5 Tele Tanar. Kine Camera Co., Japan. CX-LC-NI, \$79.50

135mm f/3.5 Tele-Votar. Piesker, Germany. Preset diaphragm, basic lens, \$69.50; adapters for AL-AH-EX-HA-PC-MR-AX-KA-KR-PK-RF-TR, \$11.85; for LC-NI-CX (uncoupled), \$11.85

135mm f/3.5 Tele-Xenar. Schneider, Germany. Automatic diaphragm, AL, \$159; EX, \$144.50; preset diaphragm, PC-PK, \$129.50; non-preset, LC, \$114.50

135mm f/3.5 Telisar. Masel Co., Germany. Preset diaphragm, EX-PC-TR, \$79.50; non-preset, LC, \$69.50

135mm f/3.5 Travegon. Schacht, Germany. PK, \$53

135mm f/3.5 Travenar. Schacht, Germany. Preset diaphragm, EX-PC-TR, \$89.95; PK-RF, \$93; non-preset, LC, \$86.95

135mm f/3.5 Westanar. Isco, Germany. Preset diaphragm, PC, \$69.50

135mm f/3.2 Algular. Karl Heitz, Switzerland. Preset diaphragm, AL, \$139

135mm f/2.8 Accurar. Photographic Importing and Distributing Corp, Japan. Preset diaphragm, EX-PC-TR, \$89.95

135mm f/2.8 Auto-Quinar. Steinheil, Germany. Automatic diaphragm, EX, \$189.50

135mm f/2.8 Juplen. Gem-Klein, Japan. Preset diaphragm, EX-PC-TR, \$69.95

135mm f/2.8 Quinar. Steinheil, Germany. Preset diaphragm, EX-PC-PK-TR, \$149.50; for Edixa, \$119.50

135mm f/2.8 Soligor. Allied Impex, Japan. Preset diaphragm, EX-PC-TR, \$89.95; MI, \$89.50

135mm f/2.8 Spectra. Aetna-Optix, Japan. Preset diaphragm, EX-PC-TR, \$79.50; non-preset, LC, \$89.50

135mm f/2.5 Angenieux Type P2. Angenieux, France. EX-TR, \$179.50

135mm f/2.5 Canon. Canon Camera Co., Japan. With reflex housing, **LC**, price to be announced

135mm f/2 R Topcor. Tokyo Optical Co., Japan. Preset diaphragm, **EX-TR**, price to be announced

150mm f/5.5 Tele-Megor. Hugo Meyer, Germany. Preset diaphragm, **EX-PC-PK-TR**, \$55.95

150mm f/5.5 Tele-Xenar. Schneider, Germany. **EX-TR**, \$64.95

150mm f/4.5 Tele-Xenar. Schneider, Germany. **RS**, \$139

150mm f/4.5 Westanar. Isco, Germany. Preset diaphragm, **PC**, \$59.50

150mm f/4 Kaligar. Kalimar Inc., Japan. Preset diaphragm, **KA**, \$79.50

150mm f/4 Soligor. Allied Impex, Japan. Preset diaphragm, **KA**, \$74.95

150mm f/4 Sonnar. Zeiss Stuttgart, Germany. **LVS** Compur shutter and automatic diaphragm. **HC**, \$313

150mm f/3.5 Astra. Sterling-Howard, Germany. Preset diaphragm, **AL-AH-EX-HA-PC-MR-AX-KA-KR-PK-RF-TR**, \$69.50

150mm f/3.5 Tele-Kilar. Preset diaphragm, basic lens, \$164.50; adapters for **EX-PC-TR**, \$15; **LC** (uncoupled), \$15; **AL**, \$24.50; **HA**, \$20; **RF**, \$16.50

150mm f/3 Telagon. Tewe, Germany. **AH-AL-EX-PC-PK-RF-TR**, \$180

150mm f/2.3 Pantachar. Astro, Germany. For all single-lens reflexes, \$275; with reflex housing, **LC**, \$425

150mm f/1.8 Pantachar. Astro, Germany. For all single-lens reflexes, \$345; with reflex housing, **LC**, \$495

180mm f/5.5 Astragon. Sterling-Howard, Germany. Preset diaphragm, **AX-EX-KR-MR-PC-HA-TR**, \$69.50

180mm f/5.5 Tele-Megor. Hugo Meyer, Germany. Preset diaphragm, **EX-PC-PK-TR**, \$82.95

180mm f/5.5 Tele-Votar. Piesker, Germany. Preset diaphragm, basic lens, \$72; adapters for **AL-AH-EX-HA-MR-PC-PK-AX-KA-KR-RF-TR**, \$11.85; for **LC-CX-NI** (uncoupled), \$11.85

180mm f/5.5 Tele-Xenar. Schneider, Germany. **EX-PC-TR**, \$84.95

180mm f/5 Astragon. Sterling-Howard, Germany. **AX-EX-KR-MR-PC-RX-HA-TR**, \$117.50; with reflex housing, **LC**, \$211.50

180mm f/4.5 Alefar. Karl Heitz, Switzerland. Preset diaphragm, **AL**, \$159

180mm f/4.5 Westanar. Isco, Germany. Preset diaphragm, **PC**, \$79.50

180mm f/3.5 Primotar. Hugo Meyer, Germany. Preset diaphragm, **ES**, \$149.50; **EX-PC-PK-TR**, \$115

180mm f/2.5 Nikkor. Nippon Kogaku, Japan. Preset diaphragm, **NI** (requires Nikon reflex housing), \$399.50

200mm f/4.5 Quinar. Steinheil, Germany. Preset diaphragm, **EX-PC-TR**, \$149.50; for Edixa Reflex, \$129.50

200mm f/3.2 Telagon. Tewe, Germany. **AL-AH-AX-EX-HA-KA-KR-MR-PC-PK-RF**, \$220

200mm Tele Ennalyt. Enna Werk, Germany. **RG**, aperture and price to be announced; **BR-BA**, \$149.50

200mm f/5.5 Tele-Xenar. Schneider, Germany. Preset diaphragm, **EX-PC-PK-TR**, \$99.50; non-preset, **RR**, \$169

200mm f/4.5 Telyt. Leitz, Germany. **LC** (for use with Visoflex reflex housing), \$172.50

200mm f/3.5 Canon. Canon Camera Co., Japan. For use with reflex housing, **LC**, \$199.50

200mm f/2.8 R Topcor. Tokyo Optical Co., Japan. Preset diaphragm, **EX-TR**, price to be announced

240mm f/4.5 Noflexar Follow Focus. Novoflex, Germany. **EX-PC-PK-AL-TR**, \$249.50

250mm f/5.6 Sonnar. Zeiss Stuttgart, Germany. **HA**, \$299.50; LVS Compur shutter and automatic diaphragm, **HC**, \$332

250mm f/5.5 Astragon. Sterling-Howard, Germany. Preset diaphragm, **AX-EX-HA-PC-KR-MR-TR**, \$79.50

250mm f/5.5 Tele-Megor. Hugo Meyer, Germany. Preset diaphragm, **EX-PK**, \$132.15

250mm f/5.5 Tele-Votar. Piesker, Germany. Preset diaphragm, basic lens, \$120; adapters for **AL-AH-EX-HA-MR-PC-PK-AX-KA-KR-RF-TR**, \$14; for **LC-NI-CX** (uncoupled), \$14

250mm f/4 Nikkor. Nippon Kogaku, Japan. **NI** (requires Nikon reflex housing), \$224

300mm f/5.6 Noflexar Follow Focus. Novoflex, Germany. **EX-PC-PK-AL-TR**, \$256.50; with reflex housing, **LC**, \$243.50; **CX-NI**, \$239.50

300mm f/5.6 Tele-Kilar. Kilfitt, Germany. Preset diaphragm, **AL**, \$179; basic lens, preset diaphragm, \$197.50; adapters for **EX-PC-TR**, \$15; **AL**, \$24.50; **HA**, \$20; **RF**, \$16.50

300mm f/5.5 Tele-Xenar. Schneider, Germany. **RR**, \$199

300mm f/5 Astragon. Sterling-Howard, Germany. **AL-AX-EX-HA-MR-PC-PK-AH-TR-KR-RF**, \$109.50

300mm f/5 Fernbild. Astro, Germany. For all single-lens reflexes, \$195; with reflex housing, **LC**, \$345

300mm f/4.5 Tele-Megor. Hugo Meyer, Germany. Preset diaphragm, **EX-PK-TR**, \$199.50

300mm f/3.5 Telagon. Tewe, Germany. Preset diaphragm, **AL-AH-AX-EX-HA-KA-KR-MR-PC-PK-RF-TR**, \$355

300mm f/4 Takumar. Asahi Optical Co., Japan. **AH-PC**, price to be announced

300mm f/3.5 TV Fernlinse. Telagon, Germany. **EX-TR**, \$360

325mm f/8 Holm & Jamer. Holm & Jamer, U.S.A. For all interchangeable lens single-lens reflexes, \$10

360mm f/5.5 Tele-Xenar. Schneider, Germany. Preset diaphragm, **AL**, \$209; **EX-PC-PK-TR**, \$189.50

385mm f/4.5 Tele-Athenar. Century, U.S.A. For all single-lens reflex cameras, \$199.50

400mm f/7.5 Astronar. Astronar, U.S.A. **EX-PC-PK-TR**, \$59.50

400mm f/5.6 Astragon. Sterling-Howard, Germany. **AL-AH-EX-HA-MR-PC-PK-AX-KA-KR-RF-TR**, \$117.95

400mm f/5.6 Fernobjektiv. Novoflex, Germany. With reflex housing, **LC**, \$266; **CX-NI**, \$262.50

400mm f/5.6 Fernobjektiv Follow Focus. Novoflex, Germany. **EX-PC-PK-AL-TR**, \$279.50

400mm f/5.5 Fern-Kilar. Kilfitt, Germany. Preset diaphragm, basic lens, \$249.50; adapters for **EX-PC-TR**, \$15; **AL**, \$24.50; **RF**, \$16.50; **HA**, \$20; **LC** (uncoupled), \$15

400mm f/5.5 Rotar. Scopus Brockway, Japan. Preset diaphragm, **EX-PC-TR**, \$179.95

400mm f/4.5 Tele-Ennalyt. Enna Werk, Germany. **PC**, \$119.50

400mm f/5.5 Tele-Megor. Hugo Meyer, Germany. Preset diaphragm, **ES-EX-PK-TR**, \$199.50

400mm f/5.5 Tele-Votar. Piesker, Germany. Preset diaphragm, basic lens, \$120; adapters for **AL-AH-EX-HA-MR-PC-PK-AX-KA-KR-RF-TR**, \$16; for **LC-CX-NI** (uncoupled), \$16

400mm f/5 Astragon. Sterling-Howard, Germany. **AL-AX-EX-ES-HA-KR-MR-PC-RX-TR**, \$129.50; with reflex housing, **LC-CX-NI**, \$133.50

400mm f/5 Fernbild. Astro, Germany. For all single-lens reflexes, \$245; with reflex housing, **LC**, \$3.95

400mm f/5 Telon. Tewe, Germany. **AL-AH-AX-EX-HA-KA-KR-MR-PC-PK-RF-TR**, \$220

400mm f/5 Telon Follow Focus. Tewe, Germany. Gunstock mount, **AL-AH-AX-EX-HA-KA-KR-MR-PC-PK-RF-TR**, \$335

400mm f/5 Telyt. Leitz, Germany. **LC** (requires Visoflex reflex housing), \$465

400mm f/4.5 Canon. Canon Camera Co., Japan. **LC** (for use with reflex housing), \$471

400mm f/4.5 Tele-Votar. Piesker, Germany. Preset diaphragm, basic lens, \$220; adapters for **AL-AH-EX-HA-MR-PC-PK-AX-KA-KR-RF-TR**, \$16; for **LC-CX-NI** (uncoupled), \$16

400mm f/4.5 TV Fernlinse. Telagon, Germany. **EX-TR**, \$360

500mm f/5.6 Tele-Athenar. Century, U.S.A. For all single-lens reflex cameras, \$249.50; for **LC** requires reflex housing.

500mm f/5 Astragon. Sterling-Howard, Germany. **AX-EX-ES-HA-KR-MR-PC-RX-TR**, \$244; with reflex housing, **LC-NI-CX**, \$348

500mm f/5 Fernbild. Astro, Germany. For all single-lens reflexes, \$393; with reflex housing, **LC**, \$545

500mm f/5 Nikkor. Nippon Kogaku, Japan. **NI** (requires Nikon reflex housing), \$550

500mm f/5 Takumar. Asahi Optical Co., Japan. **AH-PC**, price to be announced

500mm f/5 Telon. Tewe, Germany. **AL-AH-AX-EX-HA-KA-KR-MR-PC-PK-RF-TR**, \$395

500mm f/5 TV Fernlinse. Telagon, Germany. **EX-TR**, \$450

508mm f/5.6 Dallan. Dallmeyer, England. **HA**, \$569

600mm f/6.3 Tele-Athenar. Century, U.S.A. For all single-lens reflexes, \$295; with reflex housing, LC, \$295

600mm f/5.6 Fern Kilar. Kilfitt, Germany. Preset diaphragm, basic lens, \$599.50; adapters for EX-PC-TR, \$15; AL, \$24.50; HA, \$20; RF, \$16.50

600mm f/5 Astragon. Sterling-Howard, Germany. AX-EX-ES-HA-KR-MR-PC-RX-TR, \$339; with reflex housing, LC-CX-NI, \$443

600mm f/5 Telon. Tewe, Germany. AL-AH-AX-EX-HA-KA-KR-MR-PC-PK-RF-TR, \$725

640mm f/5 Fernbild. Astro, Germany. For all single-lens reflexes, \$725; with reflex housing, LC, \$875

800mm f/8 Canon. Canon Camera Co., Japan. LC complete with Canon reflex housing, \$796

800mm f/6.3 TV Fernlinse. Telagon, Germany. EX-TR, \$750

800mm f/5 Astragon. Sterling-Howard, Germany. AX-EX-ES-HA-KR-MR-PC-RX-TR, \$449; with reflex housing, LC-CX-NI, \$449

800mm f/5 Fernbild. Astro, Germany. For all single-lens reflexes, \$895; with reflex housing, LC, \$1050

800mm f/5 Telon. Tewe, Germany. AL-AH-AX-EX-HA-KA-KR-MR-PC-PK-RF-TR, \$895

1000mm f/6.3 Astragon. Sterling-Howard, Germany. AX-EX-ES-HA-KR-MR-PC-RX-TR, \$559; with reflex housing, LC-CX-NI, \$663

1000mm f/6.3 Fernbild. Astro, Germany. For all single-lens reflexes, \$1100; with reflex housing, LC, \$1250

1000mm f/6.3 Telon. Tewe, Germany. AL-AH-AX-EX-HA-KA-KR-MR-PC-PK-RF-TR, \$1100

2000mm f/10 Fernbild. Astro, Germany. For all single-lens reflexes, \$4500

2000mm f/10 Telon. Tewe, Germany. With reflex housing, LC-CX-NI, \$3500

20-in. f/6.3 Fototel. Wollensak, U.S.A. Mirror optics, for all 35mm single-lens reflexes, price on request

20-in. f/5.6 Reflector. Zoomar, U.S.A. Mirror optics, for all 35mm single-lens reflexes, price on request

25-in. f/6.3 Reflector. Zoomar, U.S.A. Mirror optics, for all single-lens reflexes, price on request

40-in. f/8 Reflector. Zoomar, U.S.A. Mirror optics, for all single-lens reflexes, price on request

80-in. f/15 Reflector. Zoomar, U.S.A. Mirror optics, for all single-lens reflexes, price on request

100-in. f/20 Reflector. Zoomar, U.S.A. Mirror optics, for all single-lens reflexes, price on request

150-in. f/25 Reflector. Zoomar, U.S.A. Mirror optics, for all single-lens reflexes, price on request

Variable: 135-225 Duo Tamaron. Accura, Japan. 135mm f/4.5 and 225mm f/7.7

Variable: 175mm f/3.5; 225mm f/4.5; 250mm f/5; 315mm f/6.3 Telestigmat. Dr. Weth, Germany. Various focal lengths by choice of lens element combinations. Preset diaphragm, for all single-lens reflex cameras, \$225

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HOW TO USE INTER- CHANGE- ABLE LENSES

THE ACCESSORY or interchangeable lens today is as much a part of a photographer's necessary equipment as an exposure meter or a tripod. No longer is the auxiliary lens considered an expensive toy for the photographer who has everything else. Modern lens designs and light alloy mounts have brought cost, weight and size to a point where every serious photographer—amateur or professional—considers the tele or wide-angle lens an absolute necessity.

Formerly tele and wide-angle lenses held specific connotations for the photographer. A telephoto brought objects closer, a wide-angle lens pushed them farther away. You used one only when you couldn't get close enough to your subject and the other when you couldn't back away far enough.

Today, photographers realize that changes in focal length not only alter apparent camera-to-subject distance, but give us entirely new perspectives. When we want to show an old subject in a new way, we change lenses. When we want to emphasize some part of a subject and minimize others, we change lenses. We change lenses to suit the mood of the subject and our own mood. We change lenses to make the viewers of our pictures see things as we want them to.

The seven pictures at *right* were made with lenses from 21 to 800mm, from a fixed camera-to-subject distance. By comparing each with that made by the 50mm lens you'll see exactly how the areas seen by each lens differ. In doing this series we also used lenses of 1000 and 2000mm. These pictures don't appear here for reasons we'll take up later, reasons which many photographers with dreams of owning such lenses ought to know.

Let's not put the cart before the horse, however. We'll start at the shortest focal length lens and work our way upward. The wide-angle lens used to be the lens you bought after you purchased a long focal length or tele lens. It was always second choice. And choice was limited generally to 35mm. A few daring manufacturers offered 28. Today,



21mm



35mm



55mm



135mm



300mm



600mm



800mm

ARE THE BUILDINGS FALLING? WIDE-ANGLE OR TELE CAN HELP

Any camera and wide-angle lens if tilted upward will produce a shot showing the buildings apparently falling over. Some but not all of this distortion can be corrected by tilting negative or baseboard during enlargement (if you're not shooting color). Instead, use perspective to heighten the dramatic architectural lines, as *opp. left*. It's surprising how this greater angle does not make the building appear to be falling over. Instead you see the church from a new angle. However, if you want to show the same section of the church in straight line accuracy, move away from the church until you can point your camera at it with little or no tilt. Then select the tele or long focal length lens which precisely outlines the area you wish to include. Here are two views of the same area. But what a difference lenses, angle and distance can make!



Tilting camera produces falling buildings

the shortest focal length available is 21mm and the number of variations in between is increasing.

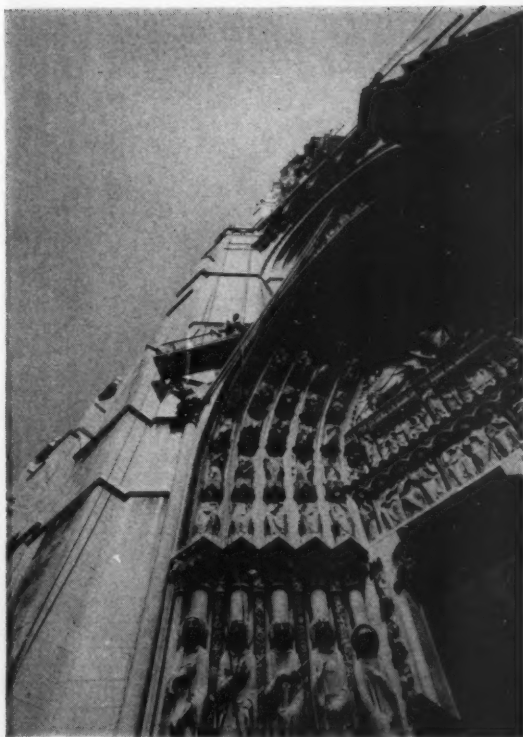
It's probably old hat to talk in terms of the wide-angle lens for landscapes. It's excellent. Almost as good as Cinemascope. And we've all become accustomed to group portraits of men sitting around a table or single portraits of a man surrounded by the sculpture he makes or the paintings he collects. Here, too, the wide-angle lens with its ability to see more area than the normal lens from the same subject-to-camera distance proves its worth. In recent years, we've expanded the use of the lens even further by learning to use effectively the apparent distortions which such lenses can produce.

Probably the most common apparent distortion caused by wide-angle lenses is the building falling over backward, as in the shot *above*. We stress apparent distortion because this common problem is not the fault of the lens. If you look up at a building and assume that your eyes are really looking straight ahead, what's the building doing? Yep, falling over backward. Actual distortion occurs only when there are faults in the lens itself (which sometimes is the case, but not here). Of course, all lenses will perform this trick to some degree if you point your camera upward. Wide-angle lenses, however, show more of the building (and so, more of the lean). And since you're probably closer to the building with the wide-angle lens, you point the camera upward at an even steeper angle, and so

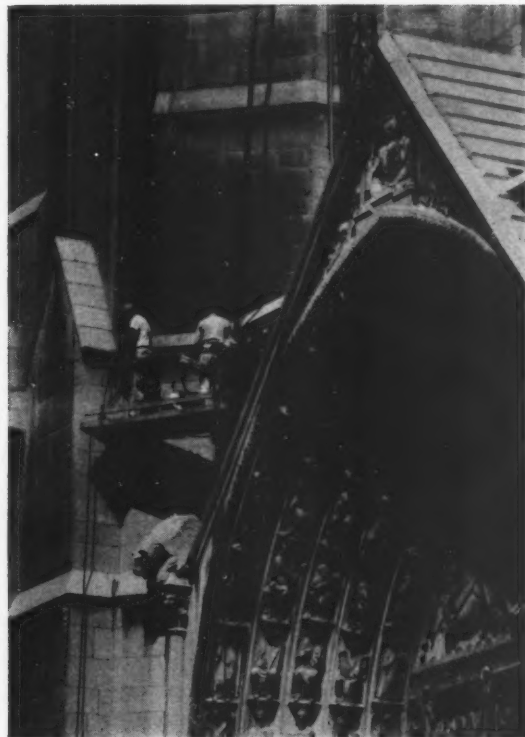
the building leans and leans and leans. The correction of the lean is simple. Keep the film plane parallel to the building. Don't point it upward or downward. You can't get the whole building into the picture? Get farther away. Photographers also noticed, in using a wide-angle lens that hands or noses, or what have you, thrust close to the lens appeared enormous in relation to the rest of the picture (*top left, page 91*). (Here, too, the distortion is apparent, not real. The rules for proper viewing of prints state that your eye should be no farther from the picture than the focal length of the lens multiplied by the degree of enlargement of the picture. If you look at the picture of the girl and ice cream stick from about six inches, you'll see that the shot looks quite natural. An ice cream stick held close to your eye *would* look big.)

Anyway, photographers began to think that there should be some way of putting this apparent distortion to work rather than spending so much time avoiding it or trying to correct it.

If pointing a camera upward makes a building lean and a wide-angle lens accentuates the effect, why not use it to show architectural subjects from new angles to make them more exciting (see picture *opp. left*). If objects close to the wide-angle lens increase in size, perhaps this increase should be used for interesting effects (*top right, page 91*). In addition, enlarged size connotes power. Horses, when photographed from straight on, look powerful if their heads and shoulders



Instead, use perspective to heighten design



To correct, stand farther away, try a long lens

are proportionately bigger than their flanks or the plow behind. Trains appear more massive and fast if the locomotives or engines seem larger than the cars following. Photographers now use wide-angle lenses whenever they want to concentrate interest. A pair of hands holding magnifying glass and object being examined dominates a picture while the head and shoulders of the owner of the hands recedes into appropriate obscurity in the background. Real? Maybe not. Effective? Certainly.

With this change in the use of wide-angle lenses, photographers were called upon to see their subjects as their lenses would. It was worth the extra effort. Try it and see.

Let's suppose you do get excited about the wide-angle lens and find yourself in the buying mood (those already owners of wide-angle lenses can either sit back and rest or think in terms of a second lens). How wide an angle lens do you buy and what aperture should it be? Personally, for a first lens we recommend a 28 or 35mm focal length. It's wide enough for you to get those landscapes and try the apparent distortions, but not so wide as to land you in trouble.

Trouble with wide-angle lenses? Oh, yes, indeed! The wider the lens gets, the more the apparent distortion, to the point where it frankly gets out of hand. For instance, with a 21 or 25mm lens, the slightest tilt from a plane absolutely parallel to the subject will produce an amazing amount of apparent distortion.

Subjects close to the edges of the picture area start to look flat (*top picture, page 90*). Camera-to-subject distance must be great or your foreground-to-background proportion problem gets out of hand.

Don't think there aren't many interesting things that can be done with a 21 or 25mm lens. But these lenses are for special purposes. You'll find more uses for a 35 or 28mm lens, and will run into less trouble. Once you've had your wide-angle 35mm or 28mm for a while and are in search of something more, then think of the 25 and 21mm.

With focal length out of the way, let's take up maximum aperture. Until a few years ago, this wasn't much of a problem. Wide-angle lenses got to $f/2.8$ or so and that was that. Today, $f/2$ or $f/1.8$ lenses in 35mm focal length are not at all uncommon. If you do much available light photography indoors, one of these faster 35's may almost be necessary. However, definition in the corners at full opening is not apt to be extremely good. The fast wide-angle lens is a much harder nut for the lens designer to crack than the standard or long focal length lenses. They are amazing, however, when you consider that lens designers were swearing up and down only a few years ago that such speeds couldn't be achieved with these focal lengths at all. If you do need one of these lenses, watch what subject material you put in (*Continued on page 164*)

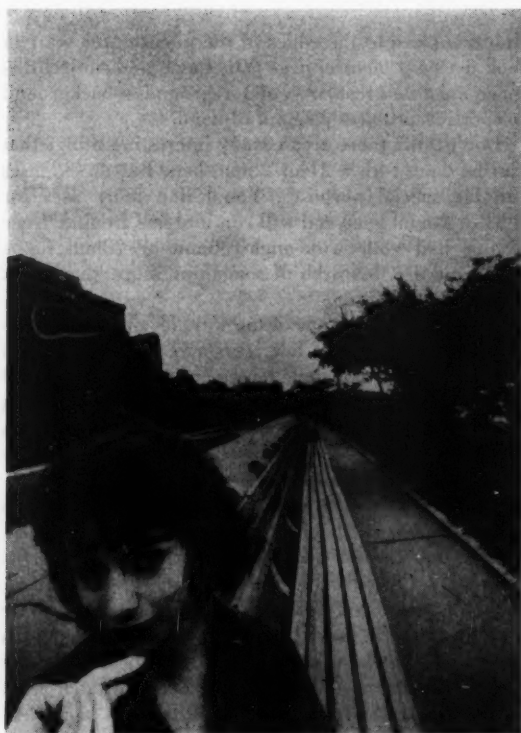
More about lenses on the next page

DISTORTION FROM WIDE-ANGLE? USE IT FOR INTERESTING SHOTS

Shorter focal length lenses, particularly 21 to 25mm must be used with discretion. Subject material at the picture edge, such as the girl at *right*, will appear flat and out of proportion. Keep your subjects closer to the picture center or farther away from the lens. Most new owners of wide-angle lenses sooner or later wind up making the gag shot *opp.left*, which quickly palls. Instead, use the apparent wide-angle distortion to emphasize or dramatize events. The shot *opp. right* is still humorous, but now it is more interesting than just a straight gag. The same effect of objects appearing large when close to the wide-angle lens can add power to horses, locomotives, etc., if they're shot straight on.



Watch for distortion of figures at picture edge



Wide-angle lens distorts face of girl in corner



Centering head corrects apparent distortion



Objects right in front of lens appear too large



Use this effect for novel, humorous pictures



Tele produces big head, eliminates background

THREE WAYS TO SHOOT PORTRAITS ONE'S WRONG AND TWO ARE RIGHT

Wide-angle and tele lenses are both used for portraits, but for different effects. Wide-angle lenses include the subject as part of an overall design of surrounding area and background. But beware of shooting downward at your subject when he or she is in a picture corner. Apparent distortion, *opp. left*, is bound to occur. Picture, *opp. right*, shows a more proper solution to the problem. The subject is centered, the background is sharp, no arm or hand reaches forward to produce apparent distortion. By using a 135 or 180mm lens from about the same camera-to-subject distance, however, you can get quite a different portrait, *left*, where the head appears dominant and the background, although much closer to the subject, has been thrown out of focus by the limited depth of field.

NEW 35 MM PLUS-X SUPERIOR QUALITY TERRIFIC SPEED!

by Y. ERNEST SATOW

QUITE RECENTLY I wrote in this magazine that until we have a Tri-X film that possesses the fine grain, resolving power and gradation of a Panatomic-X, a photographer should select from several types of film those which are most appropriate for differing subjects and his interpretation of them. No sooner had I said this than the Eastman Kodak Company put out a film that comes close to this ideal.

The new Plus-X, released a few months ago seems to this photographer after the conclusion of the first round of examinations to be one of the most useful films ever produced for the 35mm enthusiast. In quality, it comes close to Panatomic-X, and as for speed, it can be pushed as far as 1000! As shown in the exposure-development table (page 96) which Comp Photo Service of New York City helped prepare, the new Plus-X can be used for photographs which require fine grain, sharpness and gradation (such as still life, portrait, architecture) and for photographing subject matter which necessitates speed and good quality at the same time. And, as we discovered quite to our surprise, it can even be used for photographing under dim light (picture, *opposite*). All of which adds up to this: it is just about the most versatile film there is. I should qualify the above statement, as follows: This film does not and cannot duplicate the performance of Agfa Isopan FF or Adox KB-14 in terms of quality (sharpness, gradation, etc.) and what the regular fast films do in the way of pushability over the speed of 1000. But with the new Plus-X there will certainly be no headaches caused by having slow film in your camera when speed is needed or a fast film when quality in photographs is essential.

In any event, a film of such outstanding characteristics as the new Plus-X is certainly a welcome addition to the family of sensitized materials. Even though the case I made for slow films in the August issue of MODERN becomes somewhat shaky, in light of the new Plus-X, I am glad that this film has come along to fill the gap between slow and fast films and replace the old

medium-speed films so handsomely. It's an excellent film.

The Eastman Kodak Company has supplied us with the following facts about the new Plus-X:

It has American Standards Association Exposure Index of 80 in daylight and 64 in tungsten. It may be exposed at the effective exposure index of 200 for producing "top quality negatives." It develops more rapidly than regular Kodak Plus-X film. Specifically, it is to be developed in Kodak D-76 diluted 1:1 for 6 to 8 minutes at 68° F with agitation given every 30 seconds.

After scores of tests we have come to these conclusions: the film develops much faster than any other of this speed group. Whereas the old, regular Plus-X must receive development of 8 minutes (with agitation at 30 second intervals) in D-76, full strength, the new version, if exposed at 160-200, develops to about the same point in even less time in D-76 diluted one to one. If we develop it in the same soup at full strength for 8 minutes, we can effectively double this exposure index value. As you will note from the accompanying table, the addi-

GOOD QUALITY EVEN WHEN PUSHED

Plus-X retains its quality amazingly well when used in low light and "pushed" in development. Satow rated it at exposure index of 1000, took reflected light reading from shadow area of face of woman standing inside department store. He used an exposure of f/2.5 at 1/100 sec. Film was developed in Promicrol for 12 minutes at 68°. Enlargement of 25X at *far right* of contact *right*, made on Kodabromide No. 3, showed on objectionable grain even when printed on glossy paper and viewed at 2 feet.





NEW PLUS-X (Cont.)

tional development required to compensate two and a half stops underexposure does not go beyond five minutes. In general, this new film acts much like Panatomic-X in the darkroom. The latter also develops in 7 minutes in D-76 diluted 1:1, and you may also see in the table that the developing times for the compensating developer, FR X-22, are the same as those for Panatomic-X.

Sharpness of grain

Secondly, as has been pointed out, the grain is almost as fine as Panatomic-X. However, one noteworthy item about this new emulsion is sharpness. It is so improved that when 24X enlargements made from this film and Panatomic-X developed in the same developer are laid side by side, the new film has an *apparent* superiority in quality, even though the grain is not so fine as Panatomic-X. I should like to explain that this apparent superiority of quality does not imply superior grain structure or resolving power. The enlargements on Panatomic-X showed less grain, but did not *seem* as sharp. Looking closely at a breakdown of the grain structure of the Plus-X in these enlargements, the grain seemed to have excellent edge definition and sharpness which would account for the quality of the Plus-X enlargement.

A similar-sized enlargement was also made from a negative shot on the old Plus-X. It had a graininess quite similar in size to that of the new Plus-X, but the grain edges were not so sharp and well defined—which would again account for the superiority of the new Plus-X over the old. In other words, the new film does not have finer grain, but it does have a superior grain sharpness.

Quality even at E. I. 1000

Thirdly, the new Plus-X, even though it approximates thin emulsion films in many respects, is fast. In my attempt to discover the speed of this film, I exposed three rolls of film at ratings of 200, 320 and 500, and then proceeded to develop each one in one developer for the same duration of time. Upon examination of negatives and prints made from them, I discovered that negatives exposed at the index of 500 are "full" even though they fell off somewhat in shadow areas. We became curious enough at that point to go ahead and experiment with pushing them to the index of 1000. The negatives made after immersion in Promicrol for 12 minutes were good enough to be printed on Kodabromide No. 3 paper. So we can slow the film down to obtain maximum quality for outdoor shooting requirements, and if the situation warrants the high speed, it is also there when needed.

There we have it. It all sounds fabulous, even extravagant. So much so that I began to wonder if I were doing everything correctly, particularly because I began to hear about experiences of professional photographers around town. That is, some of them disliked the new emulsion quite intensely. They even decided to buy up all the old Plus-X they could get their hands on and store it in refrigerators. (This reminds me of



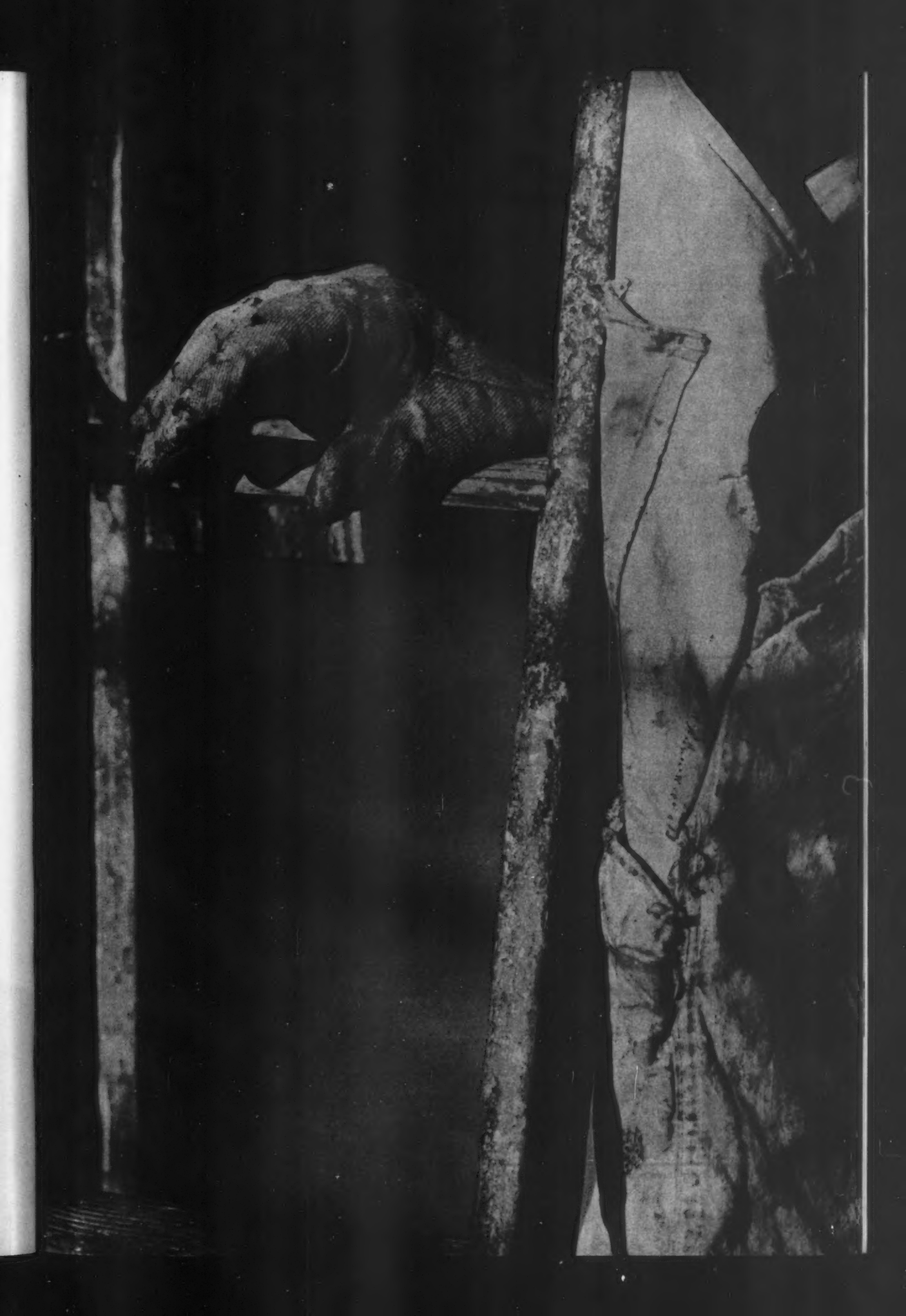
PLUS-X RIVALS FINE GRAIN FILMS

Satow made this still life using a 160 rating with a reflecting light meter reading from dark area on clothing. Exposure was 1/60 sec. at f/22 using 135mm lens on Leica M3. Film was developed 11 minutes in FR X-22. Full frame 11 x 14 enlargement of entire picture area as at *right* produced virtually grainless print. At 16 x 20, print quality was still hard to distinguish between Panatomic-X and new Plus-X prints. Detail of picture *above* enlarged 24X shows good resolution.

the time when Tri-X film came out. Some people bought up all the discontinued Super-XX in sight.) One of the complaints: the new Plus-X blocks up in highlights. I did some more shooting. My pictures were made at times under contrasty light. Some were back-lighted subjects. As far as my experience with this test went, (and especially when Promicrol and Microphen diluted 1:1 was used) it is quite difficult for me to comprehend why there should have been so much trouble.

I should now supply footnotes to the exposure-development table *page 96*. With the exception of FR X-22, Compo Photo Service who did much of the processing used a different form of agitation. Whereas films are, in general, agitated every 30 seconds (as Kodak recommends) or every 60 seconds, the developing times printed in the second part of the table were obtained by agitating films vigorously as they were immersed in the tank, again about the middle point of development and, finally, just before the completion of development. The films were thus agitated only three times. And when the film's index was pushed up to 1000, films were agitated at three minute intervals. Thus the developing times indicated in the table are valid insofar as this pattern of agitation is followed. Needless to say, you can agitate more frequently if you want to shorten the developing times.

As I have indicated already, the most brilliant negatives were obtained from the new Plus-X by using the diluted solution of one part FR X-22 to 15 parts water. If there should be any difficulties with highlights, such



compensating developers which keep highlights from blocking while they continue to develop in the shadow area can solve the problem. Because of the time limit, I could not use other compensating developers. I have a notion that Tetenal's Neofin Blue will work beautifully with this film. And I hope to supply you with any information I may obtain from this developer or any other in a future issue of MODERN.

Among the second group of developers (chart, below) which may successfully be used with this film, I liked May & Baker's Promicrol particularly well. Technicians at Compo liked the negatives developed in Clayton P-60. Microphen produced negatives with more diffused graininess than other developers. It may be best used under contrasty lighting situations. Kodak's D-23 may also be effectively employed in such light conditions. In general it produced surprisingly good results. On the other hand, D-76 in full strength should be avoided—if film was exposed under harsh light conditions. It should be used when the film was shot with flat light or when contrast is needed. Incidentally, I employed 1:3 dilution for Clayton P-60 rather than 1:2 dilution, which the manufacturer recommends for all other films. It would work much too fast for my taste at the manufacturer's dilution.

As for E. I. 1000 rolls, Promicrol and Microphen worked best. Other developers were inclined to produce fog and became much too contrasty and grainy to be successfully printed. Of the two, I preferred Promicrol, which produced truly superior negatives retaining sharpness and fine detail-recording ability of this film. (See page 92). I included Microphen for the same reason I described above—that it should work well under contrasty illumination.

I must add that the tests we conducted are by no means conclusive. We did not have the information on the new emulsion technique Kodak employed to combine such fine grain with speed.

The new Plus-X is a curious film in the sense that it reacts differently from any film we have known. It remains for us to test this film further to learn more about it. However, the impressions we gained by our first contact with the new Plus-X films were delightful ones. It follows improvements and innovations made in other areas of photographic equipment in making our photographic activities better and more flexible.

In the end, I should like to thank Compo Photo Service and its technicians, Ernie Pile and Dick Schuler, for extending their full cooperation in developing films and making enlargements.—THE END

EXPOSURE AND DEVELOPMENT TABLE

1. FOR MAXIMUM QUALITY

DEVELOPER	EFFECTIVE EXPOSURE INDEX	DEVELOPMENT TIMES AT 68° F*
FR X-22 (1:15)	160-200	11 Min.

*Agitate every minute.

2. FOR HIGH SPEED WITH FINE GRAIN

DEVELOPER	EFFECTIVE EXPOSURE INDEX	DEVELOPMENT TIMES AT 68° F**
CLAYTON P-60 (1:3)	320-400	5 Min.
ILFORD MICROPHEN	320-400	8 Min.
ILFORD MICROPHEN (1:1)	320-400	12 Min.
KODAK D-23	320-400	8 Min.
KODAK D-76	320-400	8 Min.
MAY & BAKER PROMICROL	320-400	7 Min.
MAY & BAKER PROMICROL (1:1)	320-400	15 Min.

**Agitate only three times: (1) As films are placed in the tank, (2) middle point of development, (3) before the end of development.

3. FOR MAXIMUM SPEED

DEVELOPER	EFFECTIVE EXPOSURE INDEX	DEVELOPMENT TIMES AT 68° F.***
ILFORD MICROPHEN OR MAY & BAKER PROMICROL	800-1000	12 Min.

***Agitate every three minutes.



AND D-76 ALSO WORKS NICELY

What kind of quality can you expect from Plus-X if you use Kodak's inexpensive recommended D-76 for your developer? Editor Jacquelyn Balish loaded her Nikon S, 50mm Nikkor f/1.4 lens, with the new Plus-X, made this still life in deep shade using index of 320 and exposure of 1/40 sec. at f/6.3. Film was slightly underdeveloped in D-76 (seven minutes instead of eight) and resulting negative was enlarged on Kodabromide No. 2 contrast, glossy surface. Then, tiny section of one flower was enlarged 27X. Result, mysteriously, was slightly unsharp. Mrs. Balish reshot, this time using tripod to insure maximum rigidity. Detail when enlarged appeared as at *right*. Apparently, we have a film (Plus-X) whose quality cannot be fully exploited without a rock-steady support such as a tripod. Regarding comparisons between Plus-X old, Plus-X new and Panatomic-X, differences in quality and graininess do not show up in prints smaller than 16 x 20. The new Plus-X, however, will allow a photographer maximum leeway in radical cropping during enlargement. Even a small section of a Plus-X negative can be magnified considerably with acceptable results, whether shot normally, as here, for fine grain as on *page 95* or for maximum speed, *page 93*. The main essentials in using the new Plus-X: take meter readings carefully and choose the right developer for the exposure index you decide to use. Developers can make quite a difference.

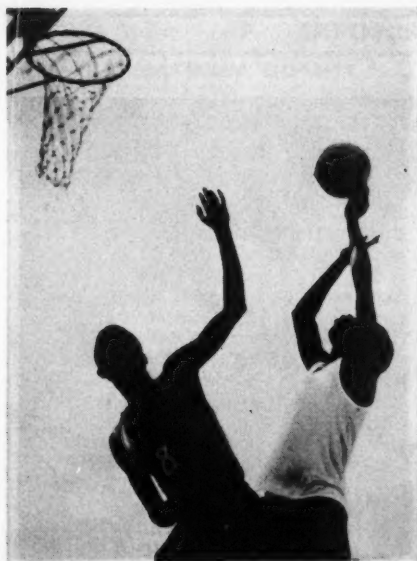


MONTHLY CONTEST

**MODERN PHOTOGRAPHY'S
MONTHLY CONTEST
FIRST PRIZE \$25
SECOND PRIZE \$15
THIRD PRIZES \$10**

A SMALL CAMERA—especially one with a telephoto lens—often allows the photographer to catch his subjects unguarded and unaware. This is one approach to “candid” photography—and does yield some outstanding images, if not always of the type admired by the subject himself. Don’t overlook, however, the more direct approach of making yourself and your camera known, and waiting for the moment to *make* (not just take) a picture. Particularly unself-conscious subjects are children, such as the two boys, *top right*. Even adults—particularly friends—will relax and accept the camera’s presence after awhile, as did the man in Conrad Little’s prize winning portrait, *opposite*.

Anyone may enter any number of black-and-white prints in MODERN’s “Monthly Contest.” Pictures must be 4 x 5 or larger, with the exception of Polaroid prints, which may be submitted in original size. Your name, address, all technical data must appear on the back of each print. No entry blanks required. *Please enclose stamped (first-class postage), self-addressed envelope* if you want unused pictures returned. All entries considered for use elsewhere in magazine. Send them to Columns Editor, MODERN PHOTOGRAPHY, 33 W. 60 St., N. Y. 23, N. Y.



FAST SHUTTER (1/250 sec.) stopped Δ basketball players at peak action in “Ballet I” by A. Varga of Toulouse, France. Rolleiflex, f/8 on Verichrome Pan. Third Prize.

IMPRESSIONISTIC form of fleeting colt suggests swiftness of motion. Carl H. Howard, Amherst, Mass., used Rolleiflex, 1/25, f/8, panned with colt for blur. Third Prize. \triangleright





REACTION of Italian boys to foreign photographer produced mischievous photo, *above*. Frank Cancian of Stafford Springs, Conn., took picture in Lacedonia, Italy on Plus-X with Nikon S-2, exposed at 1/125 and f/11. First Prize.

INFORMAL PORTRAIT was made by Conrad Little of Virginia Beach, Va., at outdoor restaurant near Rome. Exposure for shade minimized confused background. Ikonta 35, 1/50, f/5.6. Third Prize



DOG'S-EYE VIEW is taken in humorous observation by Robert Hile, Brooklyn, N.Y. Hile put Leica on tripod, positioned it on stairs leading up to U.N. promenade. This is one of series using 85mm Summarex. Second Prize.

DISCOVERY *no. 38*





ALBERT MAYSLES

Children, *opposite, above*, were photographed within a few miles of the Kremlin; station *above* and park *opposite below* are also in Moscow. All of these photographs were taken on Maysles' first trip to the USSR in 1955. He used a borrowed 35mm camera and Tri-X film, which was processed and printed for him by a professional photographer friend in New York. His present gear includes Nikon and Miranda cameras equipped with normal, wide-angle and tele lenses, as well as 16mm motion picture equipment.

"I AM APPROACHING the Czechoslovakian border. The road is getting narrower, the towns more primitive. The houses are close together and many are all white. I have come to the end of the road, in a wheat field, but there is a dirt road off to the right. In front is a blockade of cut trees. For about fifty yards beyond there is no road. Then a barbed wire fence with two lookout posts about 50 yards apart. I stop and think. I drive along the dirt road until the soldiers spot me. Then, I turn the scooter and head for the soldiers and the barbed wire. Waving my arms all the time. They unlock the gate and let me through. We exchange cigarettes." (Excerpt from Albert Maysles' diary, July 19, 1956.)

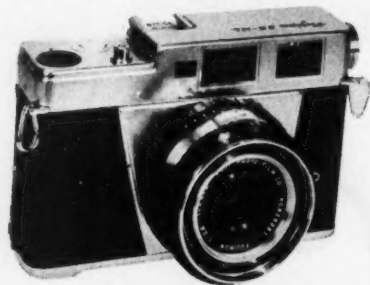
This *Discovery* is different from most. Many of the young photographers whose work appears on these pages are concerned with design. They may take pictures for self expression, or they may be motivated by an impulse of social or personal protest. Too, they tend to see the world reflected in their own backyard. Their pictures are of family, of friends, of children down the block or at the park. Some of the greatest photographers we know use this approach. It's the way some people like to work; it's the way they work best.

But photography is not the same thing to every one, and there is more than one way to go about it. Al Maysles has traveled in Russia and the satellites three times to date: in 1955, 1956 and again in 1957. And on each trip he has taken pictures. He doesn't speak Polish. He speaks only a few words of Russian. He (Continued on page 154)

MODERN

MODERN PHOTOGRAPHY'S exclusive monthly equipment report section devoted to informative, unbiased field tests of equipment submitted to the editors for review.

FUJI 35MM HERALDS NEW JAPANESE LINE



Specifications: 35mm rangefinder camera with non-interchangeable lens. **Lens:** 45mm f/2.8 five-element Fujinon. **Shutter:** Fuji Synchro MXL with speeds from 1 to 1/500 sec., B; self timer. **Viewing:** Combined range-viewfinder; luminous projected frame with automatic parallax correction. **Other features:** LVS, fold-away rewind crank on side; frame counter; film reminder dial; double exposure prevention. **Price:** \$69.95. **Importer:** Caprod Ltd., 251 Fourth Ave., New York 10, N. Y.

The first of many exports by Japan's Fuji Film Co., Ltd., the new Fujica 35-ML will soon assume its rightful place on camera shop counters. It's a tough little thing and, at \$69.95, produces sharp pictures at all apertures. Even at f/2.8, resolution was quite good in the picture edges.

The arrangement and operation of the Fujica's controls warrant special interest. First, you may use conventional lens-shutter settings if you wish (each has a separate window—im-

pressively visible—on top of the lens mount). But LVS is there, and painless, too. Set the LVS number—it's on a knurled plastic ring around the lens mount. The appropriate lens-shutter combination appears instantly.

All picture taking operations are done with the right hand. Thumb rotates the knurled focusing wheel that is set into the back of the camera near the top right hand corner. Forefinger makes the exposure by plunging the release on the top right of the camera. Thumb then advances the rapid film wind lever (single stroke) on the bottom, right.

One of the clearest range-viewfinders we've seen on any 35mm, the Fujica's gives an extremely bright image and incorporates a true projected frame.

Die-cast, the Fujica is well-built. Two construction features include a unique system of baffles behind the lens to insure even distribution of light on the film, and the lens mount itself. When you focus, the lens does not rotate in and out, but moves back and forth in the manner of a typical twin-lens reflex lens.

A novel accessory, at \$3.95, is a camera grip that screws into the Fujica's tripod socket. A braided hand band slips over your left wrist, while the grip fits between thumb and forefinger. It's a convenient and safe way to use the camera without a neckstrap!

The Fuji firm, incidentally, processes its own optical glass, including design, grinding, polishing and coating. Perhaps this helps explain the Fujica's modest price and commendable performance.—D.J.

INEXPENSIVE 35MM FOCUSES TO 1½ FT.

Specifications: Neoca IVS 35mm rangefinder camera. **Lens:** 45mm f/2.8 Neokor lens with stops to f/16. **Focuses to 18 inches.** **Shutter:** Citizen-MV, 1 to 1/400 sec. plus B, MX sync; self timer. **Viewing:** Combined range-viewfinder, etched picture frame with parallax mark-



ings. Price: \$49.95. **Importer:** Dorf Intercontinental Corp., 103 Fifth Avenue, New York, N. Y.

The Neoca is a lot of camera for fifty bucks. It lacks the latest improvements of the more expensive 35s in the field, such as LVS or a projected frame viewfinder. But, truthfully, isn't a solidly-made 35 with single stroke rapid wind lever, sharp lens even when wide open, and amazingly good rangefinder image quite a lot for the money? In addition, the etched frame, which does outline the picture area, is one of the better seen—clear and bright even in rather poor lighting. The rangefinder is also more than adequate in dim light. We pointed it into a darkened closet and had no trouble seeing the two images and getting them to coincide. Incidentally, the viewfinder image is 1:1 life size, a feature generally found only on the more expensive cameras.

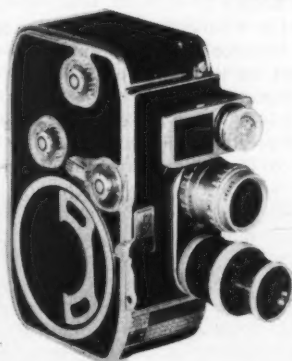
The lens has a heavily knurled front cell lens mount which focuses the camera speedily. That close focusing 18-in. distance is going to make the eye-level reflex boys (who feel close shooting is their province) slightly envious. Of course, you have to use the parallax correction lines when working at such distances. All markings, except speeds, are in white enamel against a black background. Legibility, excellent.

The camera body itself is a solid metal alloy casting. The leatherish finish should take a hard scuff or two. You could complain a bit about the quality of the chrome plate finish, but who takes pictures with that?—H.K.

TESTS

the newest cameras
the latest films
important accessories

BEHIND-LENS METER FOR NEW BOLEX B-8L



Specifications: 8mm twin-lens double-8 movie camera with built-in photoelectric cell. **Lens:** Lytar 12½mm f/1.8 in focusing mount. **Finder:** Zoom type, for 12.5 to 36mm fields. **FPS:** 12, 16, 18, 24, 32, 48, 64 and single frame. **Other features:** Cable release, continuous run lock, automatically setting exposure counter, variable shutter, drop-in loading, seven-foot motor run. **Price:** \$169.50 with Lytar 12½mm f/1.8 lens. **Importer:** Paillard, Inc., 100 Sixth Ave., New York 13, N. Y.

The Bolex B-8L solves one of the trickier problems in construction of automatic and semi-automatic exposure cameras—how to make the meter read the same field as the lens sees.

In the Bolex design, a small but amazingly sensitive photoelectric meter cell is positioned behind the taking lens—and reads directly through it. When you press the shutter release the meter jumps out of the way an instant before the shutter opens. Press a lever on top of the camera and the meter takes its place behind the lens again.

In all semi or fully automatic cameras the meter is connected in some way to the diaphragm. On most of these movie cameras, the angle of acceptance of the meter approximates the field of view of the normal lens.

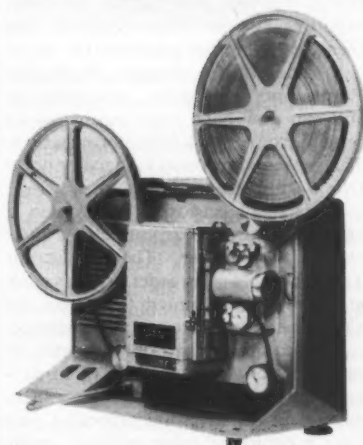
Thus, when you shift to a tele or wide-angle lens, the meter reads either too much of the scene or too little. The Bolex B-8L eliminates the problem by reading directly through the lens.

This is how the Bolex system works. First, you set a guide number opposite the speed on a dial on top of the camera. To set the correct exposure you look through the finder at the scene and line up a needle with a reference point by turning the lens diaphragm ring. Exposure cannot be adjusted while the camera is in operation. You must stop shooting, replace the cell behind the lens and take another reading. Since we tested the camera with a wide-angle lens which eliminated most of the need for panning, we rarely had to reset exposure for a scene.

We shot several rolls of color film with the Bolex and exposures were excellent. The system really showed its worth with the tele lens. The tele lens, covering a much smaller angle of view than the normal lens, often requires shooting shadow areas in the middle of a fairly bright scene. You would have to take a close-up reading with an ordinary meter to assure accuracy. The f-number for a tele shot often varied as much as one full stop or more compared with the normal lens reading for the same scene. Often the tele lens concentrated on a dark area in the scene. While the 2.5mm lens reading proved adequate for medium shots, it would have resulted in underexposure for close-ups with the longer lens.

Another advantage of the Bolex system is with filters. Since the meter reads the light coming through both lens and filters, filter factor adjustment is automatic. The meter works with film speeds from 10 to 80. All the features of the Bolex B-8VS have been retained in the B-8L. In addition, the variable shutter control now has a lever for easier operation. It can also be locked in place. The variable shutter makes it possible to double actual shutter speeds at any fps. It also can be used to add fade-in and fade-out effects while making movies. The motor stops automatically at the end of a fade.—M.A.M.

BRIGHT MOVIES FROM TINY 8MM PROJECTOR



Specifications: Argus M500 8mm movie projector. **Illumination:** Sylvania Tru-Flector 150-watt projection lamp. **Lens:** 22mm f/1.5 Argus in spiral focusing mount. **Other features:** Single 16 fps speed, provision for reverse and still projection, 400-ft. reel capacity, entire projector folds compactly for carrying. **Price:** \$89.95.

What's 6 inches wide, 8½ long, 10¾ high and weighs 11 pounds? Well it certainly isn't a movie projector—is it?

It is—the Argus M500. The new Sylvania 150-watt bulb with built-in reflector is responsible for the minute size of the new projector. A low wattage bulb (most top projectors use at least 500 watts of light) doesn't require a huge and cumbersome ventilating system nor a powerful fan. Everything can be made lighter and smaller. An internal light-focusing mirror eliminates the necessity for external reflectors and condensing lenses. But is a 150-watt bulb sufficient illumination, even if scientifically designed for maximum efficiency?

We tested the Argus against a very good standard 500-watt lamp projector we'd been using. The 150-watt Sylvania lamp threw a brilliant image (Continued on page 152)

Now! Color slides

plus why Kodak's newest flasholder never runs out of juice... how to be sure you always have the right grade of paper on hand... what only a Retina Camera owner can have... how to point out something on the screen without being rude... where to use which color film for what and why.

Negatives breed positives, in color!

On the back cover of most photo magazines last month we joyously heralded the new Kodacolor 135 Film, which brings all the potentialities of color negatives to the 35mm camera. But there's still another angle to this story:

In addition to regular Kodacolor Prints and big color enlargements, you can now have *color transparencies* printed from your Kodacolor negatives. This makes your 35mm Kodacolor negatives a truly universal medium.

Kodacolor, because it gives you a *negative*, allows color corrections *after* taking the picture. The Kodacolor Transparencies you order from Kodak are individually printed to correct for variations in exposure and color balance.

Kodacolor is intrinsically versatile. It can be used with clear flash or in daylight, *without* compensating filters. Then, when your negatives are processed, you have a choice of color prints... color enlargements... the new Kodacolor Transparencies... or you can make black-and-white enlargements on Kodak Panalure Paper. What more could you ask from one kind of film?

Which transparency film?

Now that you can get top-quality color slides from all three—Kodachrome, Kodacolor, and Kodak Ektachrome Film—which should you choose?

Answer: choose the one that best fits the situation. For instance, suppose:

- You need slides *primarily*, prints maybe. The thriftiest first-choices are Kodachrome or Kodak Ektachrome Film.

- You want prints and enlargements *primarily*, slides maybe. Pick Kodacolor.

- You're shooting a picture-story with live subjects; you need several sets of slides; little variations in pose don't matter. Thrifty way is to shoot enough Kodachrome or Kodak Ektachrome *originals* of each pose.

- You're shooting a fast-action picture story; poses can't be duplicated; you need several sets of slides. Shoot Kodacolor, and have enough slides printed from each shot.

- You're shooting catch-as-catch-can in difficult light. You don't have time to get each exposure exact. Kodacolor can be a smart choice here. It has more lati-

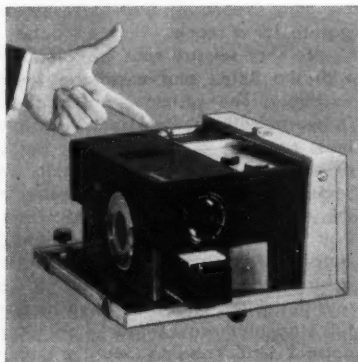
tude than reversal films, and there's always the opportunity to compensate in printing.

- You need slides with absolute maximum detail and texture. Kodachrome Film is first choice in this case; it has less speed than the other two, but higher resolution of detail.

- You're shooting fast action in situations that crowd the speed of your lens. Choose Kodacolor or Ektachrome; they offer the combination of speed and quality.

And so on. This is smart shooting: the right film for each situation. And in the familiar yellow boxes, you can pick the right film every time.

Has arrow, will point



Our new Kodak Cavalcade Projector, a "no-hands" automatic slide projector, has a built-in index finger. This is a shadow-arrow device which makes it easy to point out things on the screen during your slide shows. No need to use a stick or finger, or wave your arms, or go in for a lot of superfluous discussion.

We put this screen pointer on the Cavalcade because it's a tremendous aid to teachers, lecturers, travel bureau people, and other professional users. It's part of every Cavalcade, so you get it on yours at no extra cost.

Naturally, you wouldn't buy a projector merely to get a pointer, so your Cavalcade also includes:

- (1) Fully automatic projection at 4, 8, or 16 second intervals, with less than one second pause between slides.

- (2) Powered slide-changing either

from the projector itself; or by the 12-foot remote-control cord that comes with each Cavalcade Projector. (A 25-foot remote cord is also now available for \$2.25.)

- (3) A handwheel that you can rotate to advance the slides manually—forward, or in reverse order if you want to repeat.

- (4) A warm-air circulation system that preconditions all slides.

- (5) A slide-tray system that groups 40 slides in each tray—each slide in an individual steel protector. This way, slides move through smoothly. Even warped and dog-eared ones won't jam.

- (6) An editing ejector that lets you pick slides out of the sequence at any time—without removing the tray from the projector—in case they're in upside down, backwards, or if you want to change the sequence. This editing feature, plus the reverse feature, means you can put shows together while watching the screen. Much better than peering squint-eyed at small transparencies wondering how they'll look on the screen.

- (7) A switch that lets you select 300- or 500-watt illumination.

- (8) A brilliant, sharp-cutting 5-inch Kodak Projection Ektanon Lens, *f*/2.8. You can also get 4- and 7-inch lenses to adapt your projector for longer or shorter "throws," different screen sizes.

- (9) Smart styling and compact design that fits all the Cavalcade features into a 13 by 12 by 7-inch case.

- (10) Also, easy elevating, focusing, and leveling controls, and versatile condenser system that fully covers 35mm, Bantam, and 1½-inch square slides.

See the Kodak Cavalcade Projector for yourself. It's fun to watch your dealer put it through its paces. If you aspire to the very best, this is it. \$149.50 is its price, or as little as \$15 down.

Love that system!

Ask any proud Retina owner and he'll tell you that one of the best things about his camera (aside from its precision, speed, lens quality, etc.) is its adaptability for new projects. It's a camera that can grow with your interests.

An important factor in the adaptability of a fine camera is, of course, the range of aids available for it. Your

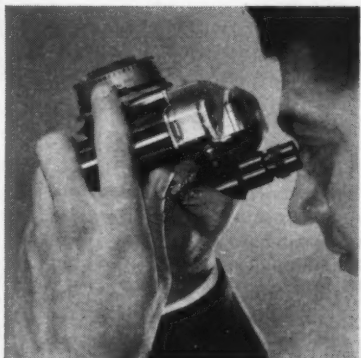
from Kodacolor!

Retina—and this includes both the new Kodak Retina Reflex Camera and the new Retina IIIC, as well as the older IIIC and IIC models—is the heart of a comprehensive system of aids.

The system's most important members are the famous interchangeable lens components—the 80mm component for telephoto and other long-focal-length work, and the ever-useful 35mm components for wide-angle shots and extreme depth of field. Each interchanges in a matter of seconds with the front component of the 50mm normal lens. The system then branches out to include a rich array of filters for all three lens



components; lens hoods, sports finder, close range and view-finder kit, close-up kit with guides and close-up lenses, table-top stand for copying and small-specimen work, field cases, a deluxe



fitted leather case, a special right-angle finder (for low-angle work, copying, etc. with the Reflex and IIIC), and even a

microscope adapter if you want to photograph the small things in life.

If you've been dreaming of new horizons, new fields of conquest, ask your dealer about the Kodak Retina system of aids... superbly correlated to the superb Kodak Retina Cameras.

How many on No. 1 paper?



How many negatives will you shoot this year that call for No. 1 paper? Well, how many on No. 2 or 3? Okay, how many that call for an in-between paper such as 2½, that nobody makes?

You don't know? Of course you don't; who could? Then obviously you don't know how much No. 1, No. 2, No. 3, and No. 4 paper you'll need. It's anybody's guess.

The way to get around such guessing is to use Kodak Polycontrast or Kodak Polycontrast Rapid Paper. With these, it doesn't make any difference. You always have a *total* supply of *each* printing grade, as long as there's *one* sheet of paper left in the box.

Furthermore, Kodak's variable-contrast "Poly" papers give you half-step printing choices that take care of the problem negatives, the ones that demand a "1½" or "3½" paper.

One box of paper—a kit of seven Polycontrast filters—and you never wind up with twelve sheets of stale No. 3 paper that you had no use for. Every sheet of Polycontrast or Polycontrast Rapid can be used with any negative you have, whether it's soot-and-white-wash or flat as a fritter.

These papers are sensible stuff. Economical stuff. And top-quality, too. Let your Kodak dealer show you sample prints, and fix you up for modern efficient printing. All popular sizes, from 4x5 to 20x24 inches.

The world is your oyster



Many of the best things in life come in small packages—like the Kodak Generator Flashholder.

Its secret is its new design. The Generator Flashholder folds to a trim, slim 3½ x 3 x 1¼ inches, weighs but 8 ounces! Neat as an oyster shell, it tucks with ease into a gentleman's jacket pocket or milady's handbag.

Most intriguing thing about the Generator Flashholder, however, is its self-sufficient "G-C" power—"G-C" meaning Generator-Capacitor. No batteries.

The capacitor is like a bucket which you fill with water, then dump all at once. In the familiar B-C system, batteries "fill" the capacitor. With our new Generator-Capacitor system you charge the capacitor by twirling the handwheel which operates the generator. Half a turn in either direction charges the capacitor. And it releases this powerful charge in one big surge when you press the shutter release, perfectly synchronizing bulb with shutter every time.

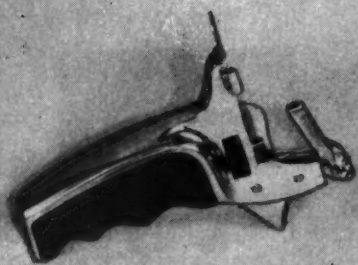
Another version of this wonderful design is the Kodak Pocket Flashholder which operates on two penlite cells instead of the self-contained generator.

Both the Kodak Pocket Flashholder (\$7.95) and the Kodak Generator Flashholder, Type I (\$13.95), come with Kodalite-type fittings and can be used with Universal Flashholder Bracket or Retina Flashholder Bracket. The Kodak Generator Flashholder, Type II (\$14.95), has a cord with both ASA and continental-type tips and a shoe fitting for mounting in your camera's accessory clip. Give them a twirl at your Kodak dealer's.

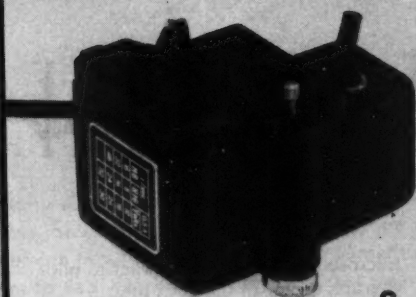
Prices are list, and are subject to change without notice.

Kodak

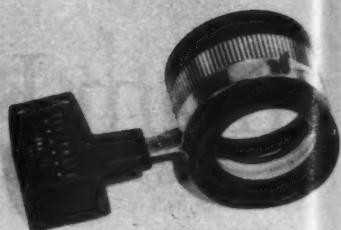
EASTMAN KODAK COMPANY, Rochester 4, N. Y.



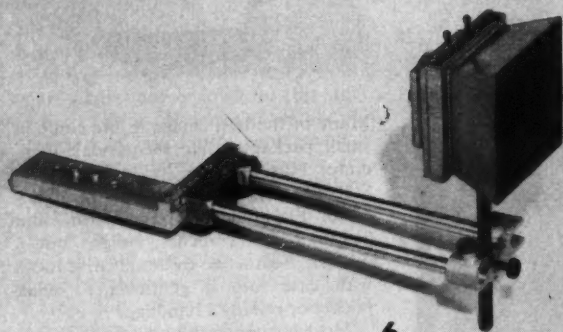
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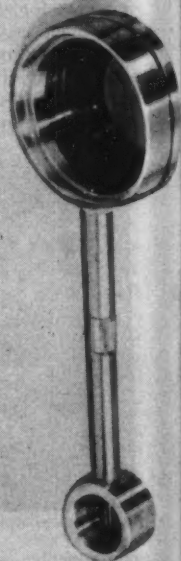
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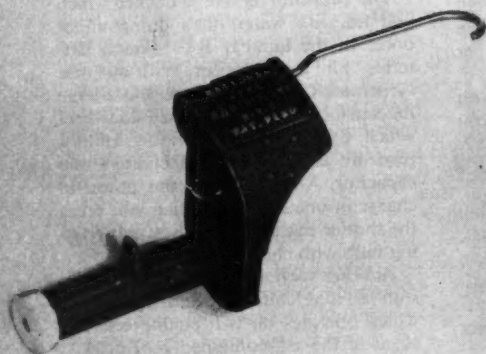
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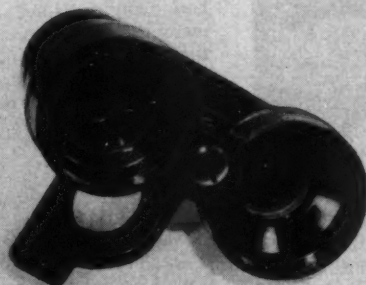
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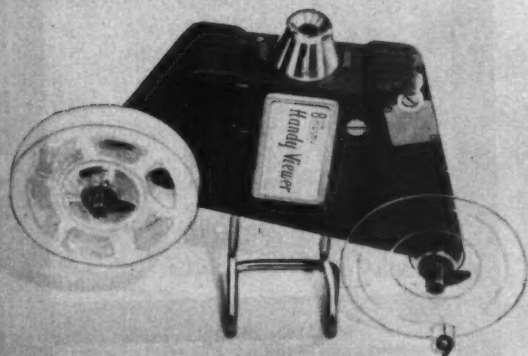
18 ACCESSORIES FOR BETTER MOVIE MAKING



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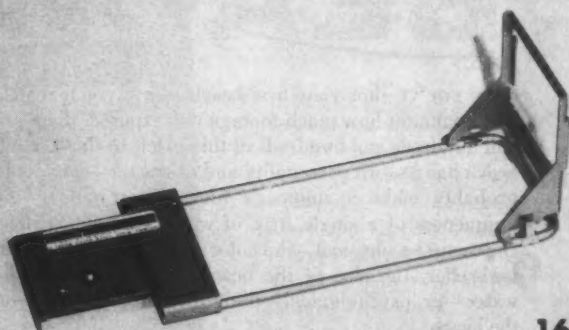
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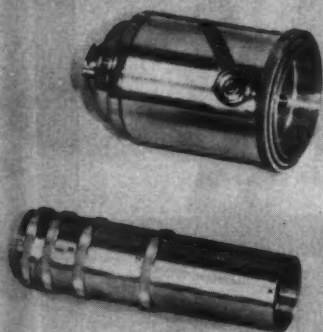
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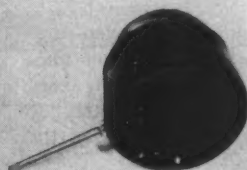
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18

EVEN IF you discover that your camera is limiting your movie making—lacks the mechanical means for making some of the footage you want—it may not necessarily be a sign that you need a new camera. Not one of them—even the most expensive—can do everything—at least, not by itself. Often, a simple accessory can increase its movie making potential many times, doing a much bigger and better job than you imagined. Even the lowest priced, basic equipment can be improved with the addition of a few accessories. The illustration, above, shows some of the many accessories available for movie making. They do everything from giving you a better grip on your camera to shooting extreme close-ups to making special effects such as fades and dissolves

right in the camera. They help a movie camera do more. Let's take a look at the accessories and what they can do for your movie making.

Pistol grips (1 and 12) come in many forms and shapes and are particularly useful for hand-held shooting with moderate tele and zoom lenses. Some, such as the Declic (1) for the Bolex B-8 and C-8 8mm cameras, \$16, and the National Cine Equipment Co. unit for the Bell and Howell 70DR, \$29.95, are designed for specific cameras. They have provision for tripping the shutter from the pistol grip itself. Others, costing as little as \$1, fit any camera, but can be used for support only.

Electric motors (2), make it possible to shoot continuously without bothering to (Continued on page 162)

Technical Assistance By Morris H. Jaffe

How to Shoot a . . .

MOVIE AT THE BEACH

ONCE YOU'VE shot your first beach movie you'll realize that no matter how much footage you exposed, there are still hundreds and hundreds of things left to shoot. Each beach has its own personality and character—you could probably make a summer's film project out of the uniqueness of a single strip of white sand. The differences can be physical—the color of the sand and beach umbrellas, the size of the beach, the blueness of the water—or psychological—the spirit of the people on the beach.

You can shoot a beach movie of your family in one day—or spend a two-week vacation recording what you all saw and felt at the shore.

Our script this month is designed to show you what can be done with a minimum amount of time and film. Actually, turning a couple of kids loose on a sandy shore can be script enough, but planning helps to catch key scenes that express in concise terms the day at the beach in terms of your own family.

With just a little forethought you'll be able to spend most of your time shooting—without worrying about technical details. However, exposure at the beach can be tricky—with white sand and blue water often fooling you and your exposure meter.

You can avoid poor exposure by taking all your readings as close to the subject as possible. If you don't have an exposure meter, refer to the slip of paper which comes with the film or use a pocket exposure guide—both Kodak and Ansco make them.

Unusual effects—shooting against the light for silhouettes of people, pilings, boats or other beach subjects—shouldn't be ruled out. Silhouettes are particularly effective if shot late in the day, with the sun just above the horizon. Expose for the brightest light in the scene. Make sure your lens has a lens shade and don't point the camera directly into the sun. If you want detail in the foreground sub- (Continued on page 160)

FAMILY MOVIE CAMERA No. 9

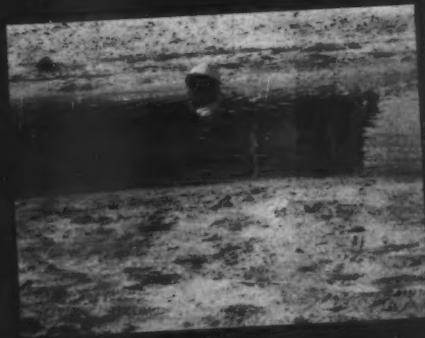


Having children rush on- to the beach over slight rise and assuming a low camera angle to begin film, help minimize distractions like telephone poles or passing automobiles. Beach ball, as noted in text, is used in script to establish continuity.

Children race past camera, almost filling lens. Shoot lots of close-ups, particularly if you are filming in 8mm. Large masses look sharper on the screen than do landscapes with tiny figures.

Scene of children dashing into the water can be effectively filmed by getting in ahead of them, shooting as they dash into the surf. Side-lit scenes, incidentally, tend to look sharper than front-lit scenes when shooting color.

Film bright colors, such as beach umbrellas, towels, but watch out for colors that clash. Also, don't allow colors to dominate the scene. Main interest in film should be story line.



Sun on water can throw exposure calculations way off. Take close-up reading with exposure meter or read off palm of your hand. Exposure guides sold in photo shops can also be depended upon for accurate exposure.

Beach ball rolling toward camera reminds audience of its existence. Start sequence with medium shot of children and perhaps adults throwing ball around. Cut to low angle as ball approaches camera. Don't overuse ball as continuity device.

Impromptu shooting may result in some of your best scenes. Children and adults act more naturally when the camera doesn't intrude and when they are not overcome by a multitude of directions.

Shooting late in the day can produce unusual colors, particularly near sunset. Scene shows weary family leaving the beach after a full day. You may want to show them gathering up beach gear, slipping on shirts, or taking a last swim.

Final scene, shot in fading light, indicates that at least part of their belongings were left behind. Scene can be even more impressive if you shoot ball reflected in a tide pool. Deflate the ball somewhat to add to character of the scene.

What's Ahead?

by LLOYD E. VARDEN

A new English advance in black-and-white film developers and a new color reproduction system.



The June 1958 issue of the London magazine *Photography* carried an illustrated article on a new high definition developer for use with high-acutance types of film, such as Kodak's Verichrome Pan, Panatomic-X and

Plus-X. The developer is said to have the property of putting certain development effects, called "adjacency effects," to practical, beneficial use.

These so-called adjacency effects have been well known and widely studied in the scientific circles of pho-

tography. In normal photographic practice they have sometimes been responsible for undesirable results. Until fairly recent years it has been thought that it would be better, overall, to take whatever measures possible to minimize adjacency effects, rather than attempt to take any advantage of them.

Why adjacency effects occur

To explain what is meant by adjacency effects and how they arise in the course of developing a film we can consider one of the effects most commonly observed. Let's assume that we have two very small contiguous areas on a film, one exposed several times more than the other. If no development effects existed, and the two exposures were perfectly uniform over the small areas, it would be logical to expect that after development, etc., the final negative would show two uniform patches of gray density, one patch being more dense than the other. But now let's

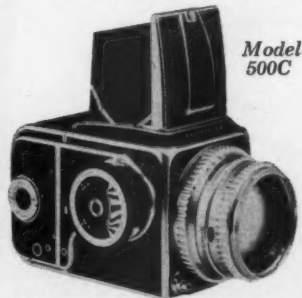
consider what actually takes place along the boundary of the two areas during the development process.

The developer absorbed by the film emulsion is exhausted at a rate dependent upon the amount of exposure at any point on the film surface. Of course, fresh developer is always being supplied, and so development continues throughout the normal developing period even in the highly exposed areas. Now the faster the developer is consumed, the greater the developer by-products become. These by-products retard the development of the latent image, but their retarding influence is more pronounced for weakly exposed areas than for strongly exposed areas. Therefore, the two competing tendencies—fresh solution tending to increase the rate of development and the by-products from the exhausted developer tending to retard the rate—produce edge, or adjacency, effects where two differently exposed areas meet. The relatively non-exhausted developer in the lesser exposed area diffuses across the boundary to accelerate development in the higher exposed area, whereas the concentrated developer by-products formed in the higher exposed area diffuse across the boundary in the opposite direction to abnormally retard development along the edge of a low exposed area. The final result is seen as an enhancement of contrast along the



the HASSELBLAD idea

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boundary edge of the two areas.

Since the appearance of visual sharpness in a photograph, and the ease with which detail can be evaluated, are largely a function of boundary contrasts within detail-containing areas, it follows that higher definition will result if edge contrasts can be increased selectively, i.e., increased without the photograph suffering from excessive overall contrast. This seems to be the trick that has been accomplished in the Kodak, Ltd., High Definition developer. The comparative examples reproduced in the article, although claimed not to show the full difference, are extremely convincing. Exposures of printed text material were made on Plus-X film. One film was developed in D-76, whereas the other was developed in the new developer. The printed text can be read from the reproductions of the prints made from either of the negatives, but the legibility and general sharpness characteristics achieved with the High Definition developer are vastly superior.

New color projection system

Several months ago Dr. William Glenn of the General Electric Research Laboratory in Schenectady, N. Y., disclosed a new color reproduction process of his before a meeting of the Optical Society of America. The prior announcements concerning the process

were so vague that it was impossible to get a clear understanding of Dr. Glenn's procedure. I was unable to attend his lecture, and what I was able to gather from others who did attend it failed to lessen my ignorance about how the process works.

The June 1958 number of the *Journal of the Franklin Institute* devotes a full page to a discussion of the process (p. 498) which makes no more sense than previous descriptions. It just goes to show that the otherwise strict editorial policy of a scientific journal can falter when glamorous subjects such as color reproduction (which the editors seldom know anything about) are presented to them by recognized research laboratories.

According to the *JFI* discussion of Dr. Glenn's process, the techniques he

discovered and applied for color reproduction are the following:

1. By recording "color information" in tiny ripples on a clear monochrome film, full-color photographs can be projected onto a screen.

2. The ripples in the film serve as a diffraction-grating system which, in conjunction with a special projector, "translates" the diffraction patterns so that brilliant primary colors result.

3. Only a single, fine grain black-and-white film is necessary, or a "chromated" gelatin layer.

4. A full-color picture depends upon only two primary colors, one fixed and one variable, instead of the customary three color primaries. The range of reproducible colors is greater than that obtainable with conventional three-color processes.

5. The Glenn diffraction-grating system produces a "positive" color picture even if the black-and-white transparency is a negative.

After reading such a completely unclear "explanation" one cannot help but think that the concluding statement in the review of the process should have been put up front. This statement reads as follows: "Dr. Glenn's presentation was 'a technical paper describing a laboratory achievement. . .'" Why not keep it in the laboratory until enough details can be released to make the workings of the process understandable?—THE END



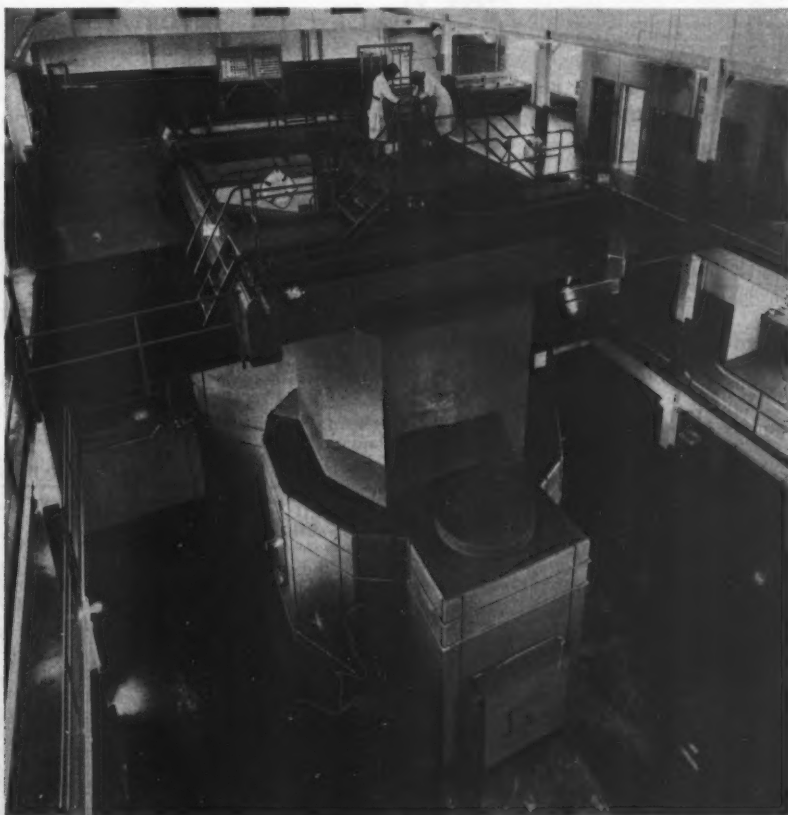
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Includes 90° Wide Angle 38mm, F:4.5 Zeiss Biogon with compur shutter for extreme speed and corner-to-corner quality without distortion. Depth of field as much as 28" to ∞. Interchangeable roll film backs. Speeds from 1 to 1/500 sec. The Hasselblad Superwide is priced at \$470.50. (Available with optional viewfinder, \$49.00, or ground glass back, \$19.50.) Write today for literature and name of dealer nearest you.



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Photographed at Batelle Memorial Institute by Herbert Loebel with the Hasselblad Superwide.

selections for OCTOBER

402 Yashica Guide, by *Richard Lowell*,
This guide begins where your instruction book ends—gives step by step instructions for perfect pictures. Basic shooting rules, portraits, candida, baby pictures, weddings, etc. all covered, plus an easy to follow chapter on the magic of color with your Yashica. **\$1.95**

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This classic text of complete coverage on every photo color process gives the working photographer the guidance he needs to get the most out of every color undertaking. Tells how to take them, process them and correct them.

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142 Retina Guide, by *Emanuel*, **\$1.95**

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25 Lootens On Photographic Enlarging And Print Quality

Newly revised edition of a standard reference on basic darkroom principles. Outlines step-by-step techniques for more sparkling prints, creative enlarging. Helpful tips to beginners, more advanced workers. Contains latest data on all variable contrast papers, new films, etc. Fifth printing. Over 100,000 copies of this classic have been sold. 266 pgs., 140 photographs. **\$4.95**

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The Nikon Manual of 35mm Technique by *George B. Wright*.

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103



Model Art

A collection of fine figure studies by Leaf, Samerjan, Bernard, etc., carefully selected to illustrate the many techniques employed. **\$1.50**

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A lucid handbook for amateur and professional photographers, explaining the law as currently interpreted in the courts, answering all legal questions. **\$1.95**



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A complete guide to buying and using all ultra miniature cameras, films, and accessories, including developing, enlarging, closeup, color, etc. An Executive Asst. to the Deputy Postmaster General of the United States the author found extreme camera portability a requisite to continuance of his photo work, and is foremost authority in this field. **\$3.95**

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* Hold 150 Glass Slides or 300
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Precision made of wood and metal • Double cut film holders.
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Box of 20 glass binders
• Cardboard Mount is inserted
between 2 pieces of thin
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3 Section aluminum tripod
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• Glass Beaded Screen surface
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Made of strong plywood with handsome
leatherette two-toned covering
For 6 trays For 12 trays For 18 trays
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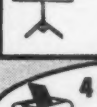
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List \$7.95
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Takes negatives from 35mm to
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LENS vs. FILM DESIGNERS

(Continued from page 59)

unappetizing image, lacking quality. Sharpness doesn't necessarily mean quality and quality doesn't mean sharpness.

Now let's imagine that you have the ideal setup. You take all your 35mm shots on a tripod which is as steady as a rock. The enlarger lens is as sharp as can be obtained and your enlarger is absolutely without movement. Even with these factors your final photograph cannot compare with that same size enlarge-

ment from the larger 8 x 10 negative.

By now you can see the additional problems that beset the engineer, film manufacturer or lens maker in his efforts to obtain for you better quality in your final 35mm photograph. It's not that 35mm photography is so far from perfect today. It's quite good, as the thousands of top quality 35mm pictures made by amateurs and professionals can attest. But it has a long road to travel before the claims made for it by some of its over-enthusiastic and unknowing fans come true.—THE END

NEW PRODUCTS

(Continued from page 22)

Ednalite Filters for Brownies

The new Ednalite filter kit designed for Kodak Brownie turret movie cameras contains three glass filters of the same color—one for each of the lenses. Filters are packaged in a plastic box and are available as follows: ChromA (85A) for using tungsten color film in sunlight, Haze for eliminating bluish tone to film when shooting on overcast days, and 80B for using daylight film with photo-floods. Price, \$6.50. Write: EDNALITE OPTICAL CO., INC. 200 N. WATER ST., PEEKSKILL, N. Y.

Low-Priced Single-Lens Reflex



The Astraflex 35mm is a single-lens waist-level reflex focusing camera with an automatic Westanar 50mm f/2.8 lens in a thread mount. The waist-level finder is in-

terchangeable with a penta-prism eye-level finder and has a built-in focusing magnifier. Focal-plane shutter speeds are from 1 to 1/1000 sec. Other features include: slow speed dial; rapid advance lever that cocks the shutter, advances film and sets exposure counter; flash and electronic flash sockets; and exposure button threaded for cable release. Price with Westanar lens is \$79.50. Other lens and camera combinations available to \$109.75. Write: STERLING HOWARD CORP. 561 E. TREMONT AVE., NEW YORK 57, N. Y.

Proximeters for Baldessas

Two Proximeter close-up attachments are now available for the Golden Jubilee Baldessa 35mm cameras. The Baldessa Proximeter I covers distances from 38 to 20 in., while Model II covers 20 to 13 in. Coupled, the two units permit shooting from 13 to 10 in. with a maximum reproduction ratio of 1 to 5. Each Proximeter consists of a lens that fits over the regular camera lens and an optical wedge that corrects the camera range-viewfinder for focusing and parallax free viewing. Regular lens shade and filter holders may be used with the Proximeters. Each Proximeter is \$26.50, including case. Write: KLING PHOTO CORP. 257 FOURTH AVE., NEW YORK 10, N. Y.

Barlight Has Click Stops



Four new Mayfair adjustable Mini/Versal barlights accept the new miniature flood lamps and incorporate push button swivel action. The system

has ten positive lock stops—one every 45°. A newly designed camera mount accepts cameras with tripod receptacles either in front or rear of the camera base. The Flexmaster Mini/Versal four-light unit does not have flexible arms, but is equipped with push button swivel action on a double-arm extension. The Flexolite Deluxe two-light unit with Dim-Brite control and flexible arms also has click stop adjustment. It is also available without Dim-Brite switch. The Foldamatic-Two Mini/Versal two light unit comes with or without Dim-Brite switch. Prices are: Flexmaster, \$13.95; Foldamatic-Four, \$13.95; Flexolite, \$10.95 with Dim-Brite switch or \$9.95 without it; Foldamatic-Two, \$10.95 with Dim-Brite and \$9.95 without it. Write:

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A GALAXY OF IMPORTANT FEATURES!

- **ONE-PIECE UNIT**...completely balanced...completely portable...weighs only 36 ounces. No bulky shoulder-slung battery case...no tangled cords.
- **HERMETICALLY-SEALED PERMANENT BATTERY**...no leakage...no corrosion...Never needs replacement. Permanently wired in Vanguard...provides unvarying light output.
- **BUILT-IN BATTERY RECHARGER**...recharges from any 110-volt AC line.
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- **2 POWER TRANSISTORS**...for maximum efficiency, dependability, compactness. Silent operation.
- **"LIFETIME" FLASHBULB**...built to provide thousands upon thousands of flashes.

- **BUILT-IN EXPOSURE DIAL**...assures easy operation, accurate exposure. Daylight Kodachrome Guide No. 30-40.
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Special Report from the
West German
Photographic Industry



PHOTOKINA: WORLD'S MOST FAMOUS PHOTOGRAPHIC

EXPOSITION

Indeed these are the magic nine days for everyone enjoying photography or making money at it: September 27 through October 5, 1958, in Cologne, Germany. Here, Photokina, the International Photo- and Cine-Exposition will once again take place.

Held every second year, Photokina is the greatest existing international photo trade fair. It is the focal point for the display of the achievements of the photographic industries and cinema technology of all producer countries and represents an economic force of powerful influence. Secondly, it is the greatest international photographic cultural show.

The imposing picture of Photokina in 1956 was described by MODERN PHOTOGRAPHY magazine this way: "Imagine being lost in a camera store 100 times larger than the biggest in the world, completely surrounded by the cameras of the future and new models of old favorites. Such a dream would represent a small fraction of the new equipment seen at this year's International Photokina at Cologne, Germany, an equipment and photographic show so large it approaches the impossible. . . On the balconies a series of tastefully displayed photographic exhibitions contained a total of 3,300 pictures by professionals and amateurs from 35 different countries."

Although one might well imagine that this 1956 description could not be surpassed, the scope of this year's Photokina is even larger! Let us compare a few figures. In 1956 Photokina had 502 exhibitors altogether: 319 German exhibitors of photographic equipment and 44 German exhibitors of cinematographic equipment, also present were representatives of 20 American firms, 119 firms from other countries. The 1958 Photokina most probably will show an increase of at least ten per cent in number of exhibitors. Instead of 660,000 square feet of space, more than 700,000 will be occupied. No nation of photographic importance will be missing. Among them will be: Belgium, Denmark, Great Britain, France, the Netherlands, Italy, Japan, Austria, Spain, Sweden, Switzerland, Czechoslovakia, the United States of America. A more comprehensive representation of photo and cine products is unimaginable. (Continued on page W-30)





Quality,

1840

*...World's First
All Metal Camera*

This first metal camera was an important Voigtlander milestone in photographic history. Because of this camera and other Voigtlander pioneering advances in this field, photography did not stagnate at its very start. On the contrary, the manufacture of this camera so captured the interest of the public, that it led to the present importance and delight of photography today.



These Voigtlander "Firsts" Helped Make Photography What It Is Today!

1815 . . . World's First Theatre Binoculars—

This type of instrument which was also used as a field- and long range-glass, is still in use as a theatre and opera glass.

1900 . . . World's First Speedy Anastigmatic Lens—

The Heliar f/4.5. Even today, the Heliar still remains the favorite portrait lens with many professional photographers the world over.

1901 . . . World's First Reflex Vida Camera—

The first lighter, simpler, and less expensive camera that helped to popularize amateur photography. Also the Voigtlander stereo camera.

1929 . . . World's First Camera to Sell More Than 1½ Million Pieces—

This was the Bessa, a real "people camera" which was the nucleus of the Voigtlander program for many years.

1949 . . . First Color Skopar Lens—

This lens made colors more faithful and reduced vignetting at full aperture. The Color-Skopar was followed by the Color-Heliar, Ultron, Nokton, Apo-Lanthar, Dynaron and Skoparon—all high-efficiency lenses, all major optical advances.

Look to Voigtlander

for the photographic "firsts" of the future!

a habit for 202 years



THE PRODUCTION of quality instruments is second nature with Voigtlander. It began back in 1756 when Johann Christoph Voigtlander started creating scientific instruments such as compasses, delicate quadrants and fine testing instruments, all of such skilled craftsmanship, he won the favor of the Austrian Emperor's court. The Voigtlander philosophy is simple. Never be satisfied with anything but the best. Keep making things better and better!

With this basic principle as a guide, the Voigtlander firm can look back on many milestones, on many famous "firsts" in the camera world. Such as the wonderful new Vitomatic cameras illustrated above that have quickly established a new standard of quality and picture taking simplicity. But good as the past has been, who has time to look back? Not Voigtlander. We're too busy looking to the future and the development of many new ideas in photographic equipment.

The new camera with the **AUTOMATIC** eye for **COLOR**

VOIGTLANDER

SINCE 1756 • SAY PHOTO-LANDER • H. A. BOHM AND COMPANY, SOLE AMERICAN IMPORTERS, 4761 W. TONHY, CHICAGO 46, ILL.

QUALITY CONTROL: KEY TO FINE PHOTOGRAPHIC EQUIPMENT



Mysterious? No! The West German photo industry guards no secret to success other than the traditional *precision* with which its products have been manufactured for many years. Thus anyone buying a West German camera knows that he has obtained equipment that has been made and tested by craftsmen.

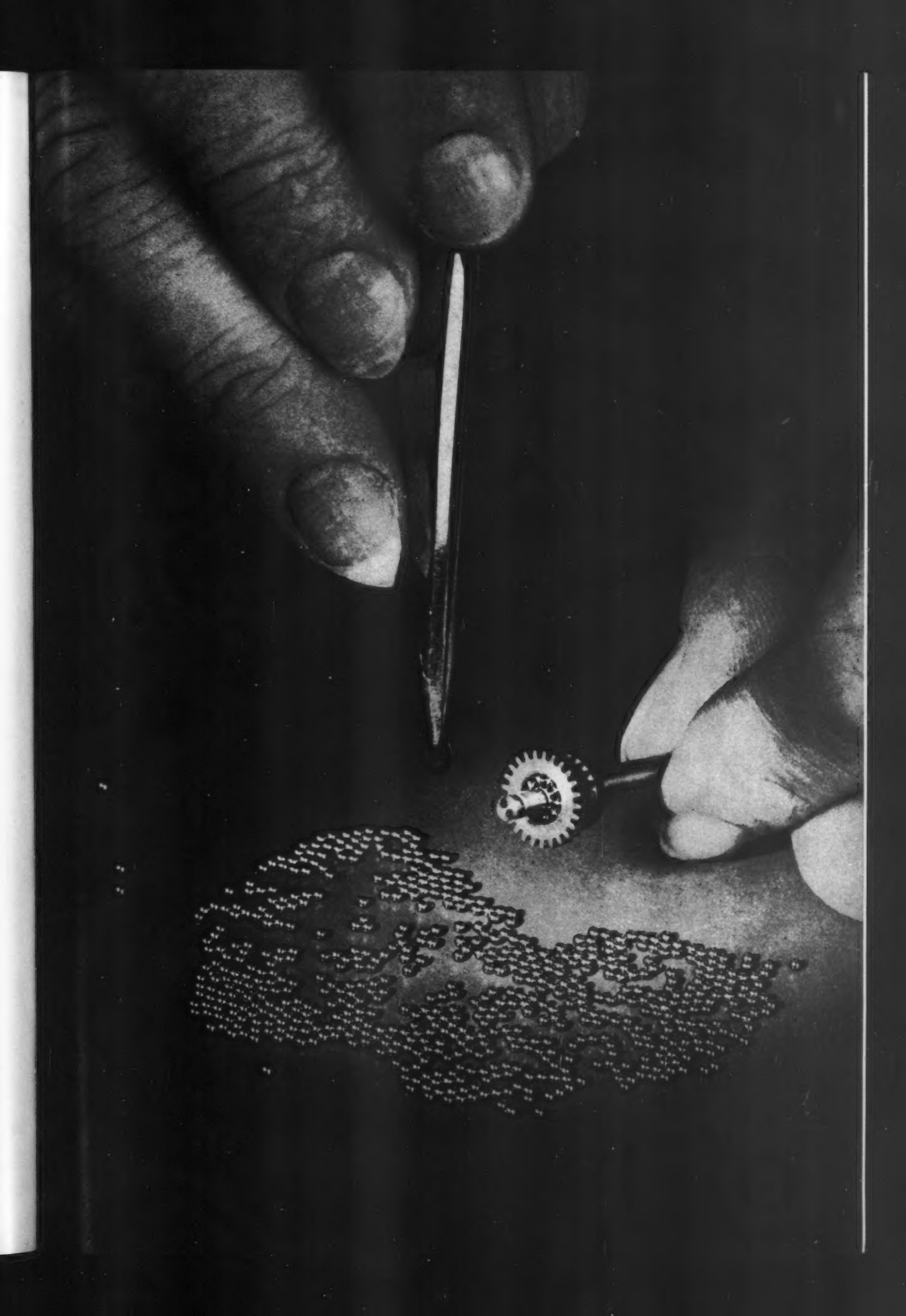
Cameras, lenses, shutters—all receive a battery of checks and examinations during manufacture in order to supply finished products and avoid production delays. But, to accomplish this end, special testing methods which are less familiar in other countries have had to be devised. First, although a combination of camera body, lens and shutter makes up the finished camera, these parts are all separately subjected to suitability tests by their suppliers. Many individual checks are carried out before final assembly. Each body, lens or shutter firm bears full responsibility for the products it makes.

The number of different parts needed for a precision West German camera varies, of course, with the type of camera, yet still is very high. To insure uniform quality of all these parts, special machines and automatic apparatus have been designed by the German camera industry which work to extremely fine limits. But in spite of this, it is necessary to keep a constant check on these parts during production—which is why a principle of “statistical quality control” (a system of continuous machine supervision) was adopted. (Thorough as these methods were, human error was always a possible threat. In cases involving surface cleanness as well as accurate measurements, additional testing methods had to be found to eliminate the faults of human shortcomings.)

The next checks take place when basic parts are first assembled into components. These checks are especially important because all firms try to keep any unserviceable parts out of their assembly lines. Here, pneumatic, mechanical, optical and electrical methods are used. When the various components are complete and have passed through the final assembly stage, each camera is given a strict individual check-up that includes operation as well as surface cleanness. (Naturally the methods used vary according to the type of camera.) Then, to make absolutely sure of the

(Continued on page W-11)





Why ROLLEI remains

UNQUESTIONED LEADER IN

*... why better pictures—more published pictures
are taken with Rollei than with any other camera*

To produce Rollei quality requires more . . . *much more* . . . than just business sense and a knowledge of fine mechanics. It must start with an *ideal*. And to make that ideal a reality, *original* thinking and *original* design concepts are essential . . . as well as complete dedication to the ideal in every step of manufacture and assembly.

This is the atmosphere in which Rollei was originally created . . . and in which Rollei is made to-day. Expert design talent is constantly contributing to the basic camera *new features* which keep Rollei far ahead in convenient, fool-proof handling . . . greater flexibility in usage . . . and more accurate picture results.

In the manufacture of each part, only the best

suited, longest-lasting materials are used, and closest tolerances maintained. Then only highly skilled, experienced hands build the camera: *because hesitant hands cannot produce quality worthy of this great name*. And that high quality is maintained through-out every manufacturing step, by the most modern scientific controls.

Thus Rollei has become the inevitably relied upon *working tool* of professional photographers the world over . . . as well as the favorite camera of critical amateurs and other camera users who appreciate that only a *top quality* camera can give consistently perfect picture results . . . complete satisfaction . . . through-out the years. See Rollei at your dealers now, or write for literature.

Now . . . the greatest values ever in ROLLEI CAMERAS!



Rolleiflex f:3.5

with XENOTAR lens . . . \$199.95
with PLANAR lens . . . 214.95

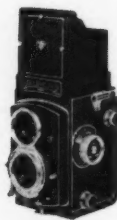
with built-in meters:
XENOTAR lens 234.95
PLANAR lens 249.95



Rolleiflex f:2.8

with XENOTAR lens . . . \$259.95
with PLANAR lens . . . 274.95

with built-in meters:
XENOTAR lens 294.95
PLANAR lens 309.95



Rolleicord Va

The five format camera—
takes pictures 2 1/4 x 2 1/4,
1 1/2 x 2 1/4, 1 1/2 x 1 1/2 for
super slides, Bantam size
and 35 mm. LVS shutter,
XENAR lens. \$99.95



Rolleiflex 4x4

Uses #127 roll film—nega-
tive size 1 1/2 x 1 1/2 (super-
slide size) Automatic opera-
tion—Synchro-Compur LVS
shutter—Schneider XENAR
3.5/60 mm lens. \$139.95

All prices without cases. Inter-
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Rolleicord Va extra.

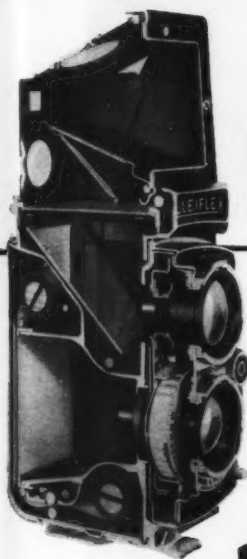
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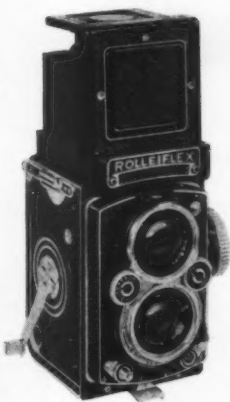
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TWIN-LENS CAMERAS

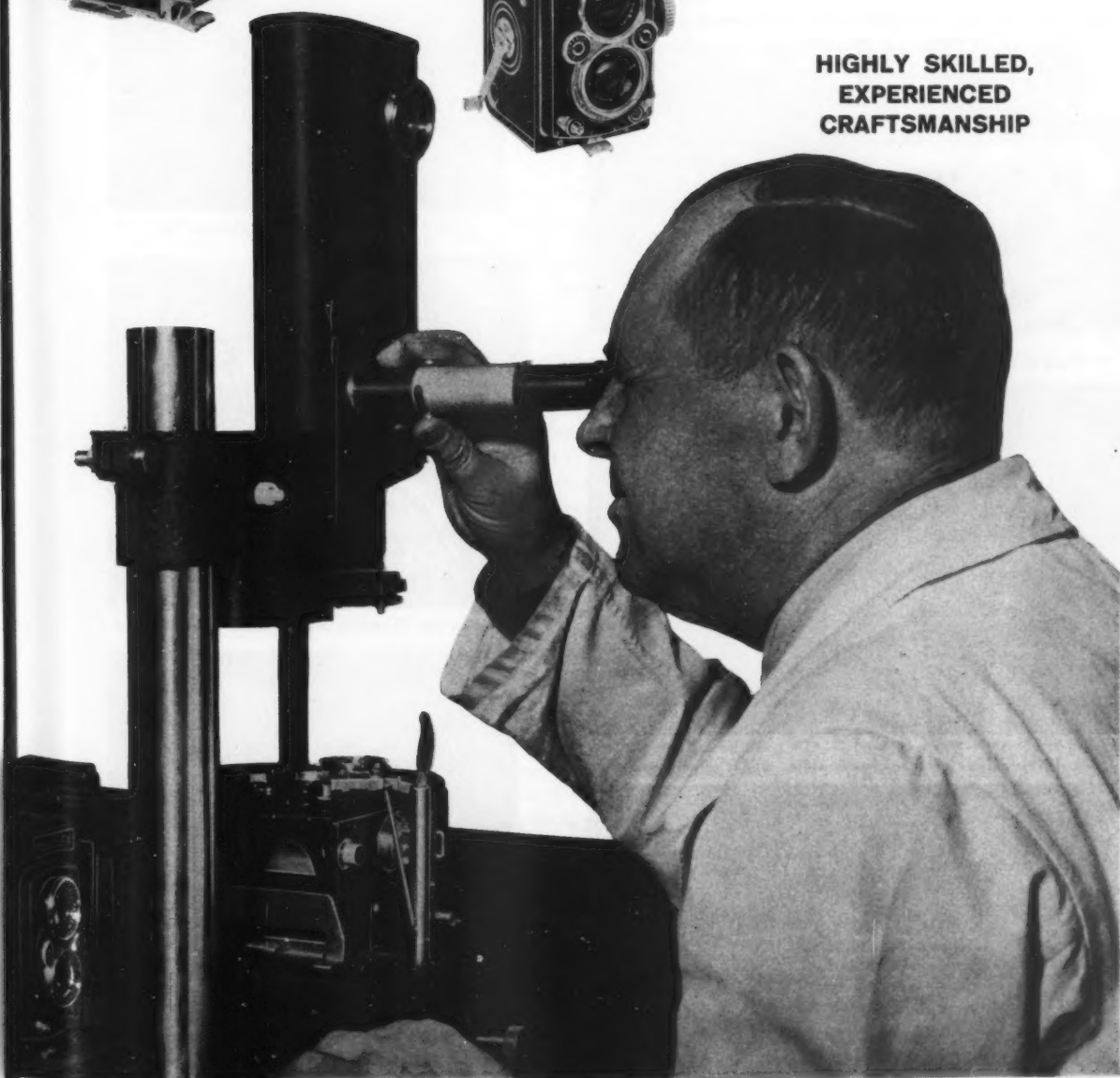


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**HIGHLY SKILLED,
EXPERIENCED
CRAFTSMANSHIP**



Electronic device tests how moving parts are working.



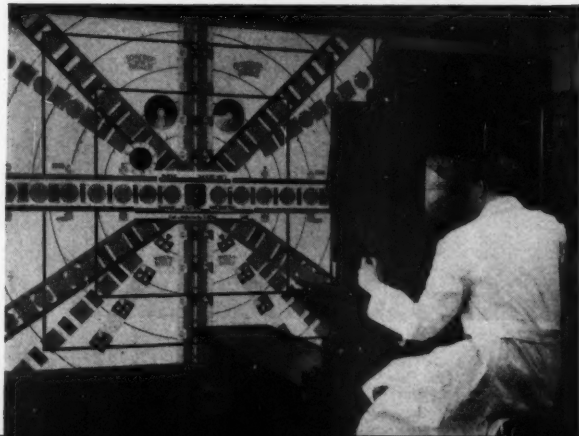
Full view of large assembly room. Neatness is essential!



Targets and telescopes are used to check viewfinders.



A 300mm lens receives meticulous target check-ups.



For $2\frac{1}{4}$ reflex: a lens alignment test.



Lenses are mass polished, then inspected.



A delayed action release is built into a 35mm.

Optical characteristics of lens are checked by collimator.



QUALITY (Continued from page W-6)

camera's operational reliability all its parts are tested once more—a long and tedious final check.

Although every camera is given an extensive final check-over of this kind, some firms go even further and make special test exposures on film. Filed away with the manufacturing records in the makers' plant, these test negatives are proof at any time that the camera operated properly and met the required standard.

Apart from all these examinations, additional spot checks are made on each production series. This guarantees that results remain constant in a given production batch. Some tests are made in laboratories where cameras are examined for light leak and for reaction to heat, cold and tropical conditions. The hard, practical test to prove their shock resistance and sturdy construction can also be regarded as a check. With some camera selected at random, endurance tests are carried out in which the mechanism is operated many thousands of times to discover any weak parts.

Checks by the optical industry

Even before actual manufacture starts, checks are made on raw glass. The intermediate examinations which follow are so arranged that unsuitable elements or those requiring further processing are removed from the production line.

Naturally, there are different methods of lens checking, depending on the type of objective desired. A lens for the professional and advanced amateur photographer, for example, is given a vigorous test, since the demand made on it is particularly high. In this connection, the West German optical industry in recent years has increased the practice of testing for close-up photography. For this purpose, a test wall is used, with a special camera placed in front of it, fitted with the lens being tested, and loaded with film or plates. These are studied under a microscope, and, by analyzing the results, the operator can check its resolving power.

When testing photographic lenses having focal lengths of about 28mm to 150mm, some manufacturers used collimators with which the quality of the lens can also be studied and judged by means of a microscope. One special method of this kind is known as auto-collimation. Here a large number of lenses can be checked in a short time, which reduces checking costs and still gives maximum testing accuracy.

Tests go beyond those for lens resolution in order to get a sharp image. For example, the flange (to focal plane) distances of interchangeable lenses must be kept to very close tolerances. With a single-lens reflex (or a camera in which the shutter leaves of the between-lens shutter are behind the optical system) the back focus of the lens should not fall below a certain minimum.

Other tests for certain types of lenses are determined by an interferometer with which it is possible to detect slight streaks in the glass, eccentricities and very small deviations in radius.

Some of the West German optical firms adopt what is known as the projection test for checking 35mm camera lenses. The lens to be tested is placed in a special projector containing a test slide.

Checks by the shutter industry

German shutter manufacturers give their products severe tests—it is no exaggeration that those passing this examination are described as "high-performance precision shutters." Here again, the checks start with the separate parts and initial components. But most important of all is the final operational check-over. A special apparatus constantly controls operation and rejects defective shutters. The reason for the fault can be determined later without the need for continuous supervision of it and thus production slowdown.

These operational tests, which control all the functions of the shutter, are combined with a supplementary electrical device for testing the flash contacts.

Special equipment is also required to check shutter speeds. Electronic machines are used for the actual measurements as photographic methods would be too tedious. Very often special time measurements are made, particularly for single-lens reflex cameras having pre-set diaphragms, and these enable the diaphragm closing time to be controlled exactly.

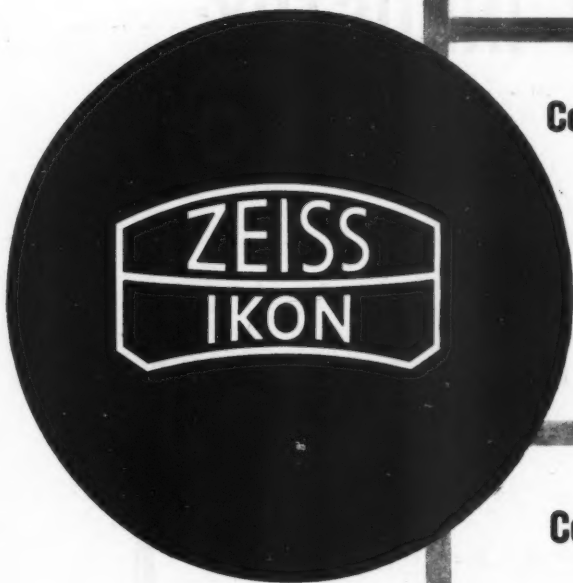
Finally, electronic measurements must be made to see that camera shake, caused by releasing the shutter, does not impair its operating efficiency in any way. Further shutter tests in conditioning cabinets and special cold chambers determine resistance to climatic conditions. Not only is this the best way of ensuring satisfactory operation of the shutter mechanism, it also signals any signs of fatigue or risk of breakage.

Whether for cameras, lenses or shutters all the production tests and checks mentioned here show with what seriousness the West German photographic industry regards its work. The industry is conscious of its great responsibility in continuing to supply the world with precision cameras.—THE END



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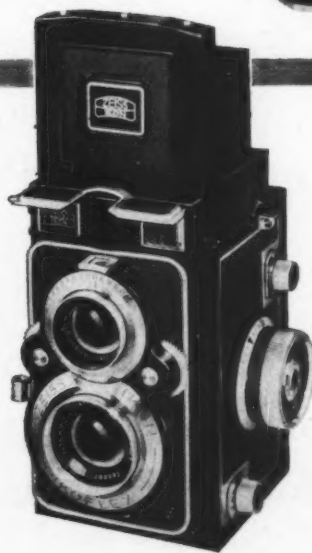


Contax

Contaflex



Contina



Ikoflex

FAMOUS FIRSTS FROM THE WEST GERMAN PHOTOGRAPHIC INDUSTRY:

1826, first astronomical f/3.5 four-element lens, C. A. Steinheil

1839, first pocket size camera, C. A. Steinheil

1840, first all metal camera, Voigtlander

1840, first computed photographic lens, Petzval of Voigtlander

1890, first anastigmatic lens, Protar, Carl Zeiss

1895, first objective with interchangeable front element as convertible lens Double Protar, Zeiss



1924, first widely successful 35mm camera, Leica A, E. Leitz



1928, first leaf type shutter with ring setting, speeds up to 1/300 sec., self timer, Compur-Werk



1929, first 2¼ twin-lens reflex, Rolleiflex, Franke & Heidecke



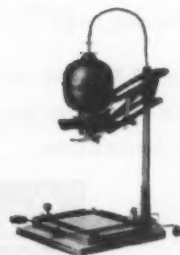
1930, first 35mm camera with interchangeable lenses, Leica C, E. Leitz



1931, first 4 x 4cm twin-lens reflex, Rolleiflex, Franke & Heidecke

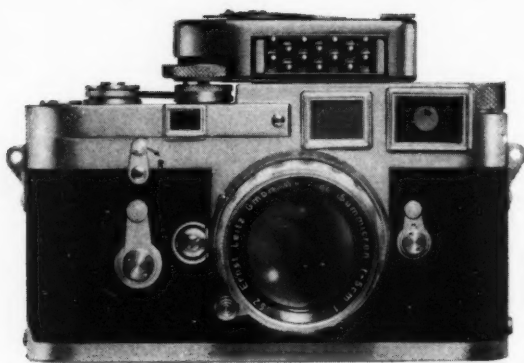


1931, first 35mm camera with interchangeable lenses coupled to rangefinder and 1932, first camera with a rotating wedge rangefinder, Contax I, Zeiss Ikon



1933, first automatic enlarger for 35mm negatives, Focomat I, E. Leitz

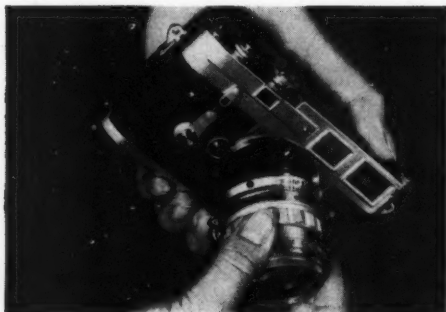
(Continued on page W-18)



THE LEICA M-3 MAKES PHOTOGRAPHY SO FASCINATINGLY SIMPLE

• In seconds...the best composition • Pick the frame that suits you with the M-3's unique "frame selector" • Press bayonet lock button and twist lens slightly—it's out • Snap in lens matching frame you selected • Focus and shoot • That's all there is to it.

When you put the bayonet-mount Leica lens (35, 50, 90 and 135 mm) on the camera, the correct frame stays in view, the range-finder is coupled, and **parallax is automatically compensated** throughout the focusing range.



• In seconds...the best exposure • Pick f-stop on your lens • With knurled control, line up the Leica-meter MC dial so that your f-stop is opposite indicator needle • Your shutter speed is now set • Focus and shoot • That's all there is to it. The Leicameter MC goes onto the M-3 simply, coupled to the shutter speed dial. If you want a certain shutter speed, simply set it into the camera with the knurled knob and then look opposite the indicator needle. There's your f-stop.

The LEICA M-3 frees you from complications so that you can concentrate on your subject. What could be more fascinatingly simple and give you the precision of the Leica M-3? It makes picture-taking a real pleasure. Ask your LEICA Franchised Dealer for a demonstration.



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it takes patient hands to build a precision camera

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When you buy a camera, make sure it's built with this care and precision.

When it bears the name LEICA, it is precision at its ultimate. Leica cameras, lenses and photographic accessories are made by Ernst Leitz GmbH in Wetzlar, West Germany.



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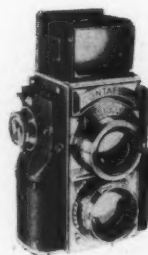
02199

1934, first camera with viewer and rangefinder in one eyepiece, Contax II, Zeiss Ikon



1935, first factory coated lens, Zeiss

1935, first camera with built-in photoelectric exposure meter, Contaflex twin-lens reflex, Zeiss Ikon

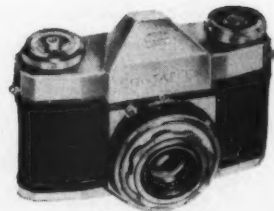


1936, first triple-layer color film incorporating dyes which did not wander, Agfacolor, Agfa

1953, first fully automatic diaphragm in interchangeable lens, Schneider



1953, first single-lens reflex camera with between-lens shutter and fully automatic iris diaphragm, Contaflex I, Zeiss Ikon



1954, first 35mm camera with mirror-reflecting view finder-

(Continued on page W-20)

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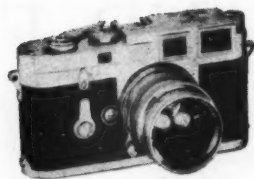


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rangefinder and automatic image outline masks, Leica M3, E. Leitz



1954, first leaf type shutter with LVS, coupled lens diaphragm and shutter speed scales, Compur-Werk



1956, first 2¼sq. with automatic exposure, Agfa-Automatic 66, Agfa

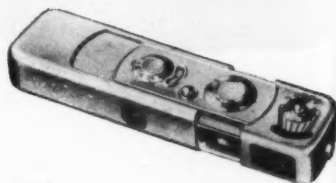
1956, first leaf type shutter enabling interchangeability of lenses and incorporating automatic depth of field indicator, Compur-Werk



1957, first 35mm with between-lens shutter coupled to built-in exposure meter, Vitomatic I, Voigtlander, and Silette SL, Agfa, with Prontor-SLK, Alfred Gauthier



1958, first ultraminiature camera with built-in photoelectric exposure meter, Minox



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**Steinheil
presents...the new
f1.9 Auto-Flash
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with built-in
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Today, Steinheil ranks first as the leading manufacturer of precision automatic lenses for Exakta cameras. Steinheil lenses with automatic diaphragm are now available in various focal lengths for normal, wide angle and telephoto photography.

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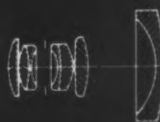


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The five element Quinar Telephoto lens has achieved world wide prominence as the most outstanding fully automatic telephoto for the Exakta. Its fine optical qualities and dependable automatic mechanism have made this lens a spectacular success. Price \$189.50 list, including leather case and sun shade.

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Geodetic instruments • Highest precision fine measuring devices
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Astronomical instruments • Electron microscopes, etc.

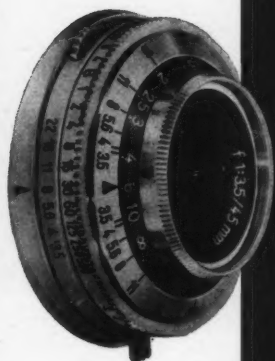
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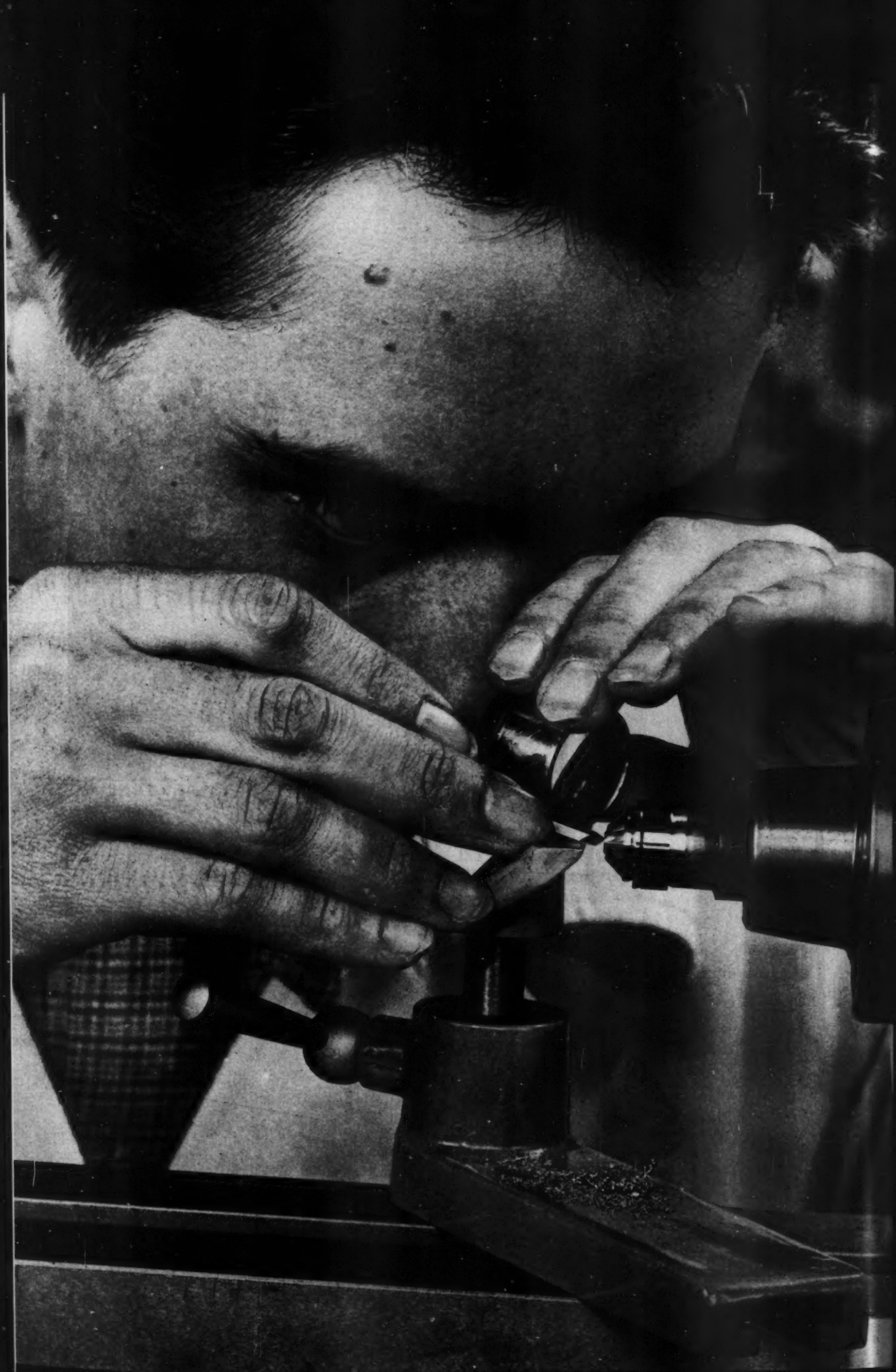


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WEST GERMAN APPRENTICE SYSTEM: KEY TO PRECISION

The West German photographic industry faces the future with confidence, knowing that it has a reserve of young technicians and specialists who have had the most exacting professional training in the field of precision mechanics and optics. The West German training instructors take particular pains with the new apprentices who come to them year after year. They realize the great responsibility which has been entrusted to them by the photo industry and the obligation they have towards these young people who must be trained as reliable and efficient tradesmen in a period of 3½ years.

Only the best applicants are selected by the professional advisory centers located in various towns and cities. Then the individual photo firms give these young people aptitude tests based on very high standards. These high standards can be set according to their particular needs by the individual firms since there are always more young people applying for training in the West German photographic industry than can be accepted.

To meet the requirements of the aptitude test each applicant must pass both practical and theoretical examinations, regardless of whether he wants to be an optician, precision mechanic or toolmaker. He is examined for his overall intelligence as well as his particular talents, manual skill and carefulness in practical tests. The marks obtained in this first examination are kept and used for comparison purposes in all intermediate examinations and for the final grading after the training course is completed. This first aptitude test is, of course, based on the latest knowledge available regarding personnel management and on the most modern vocational testing methods. Some of the tasks set for these apprentices are very exacting, if you keep in mind that their age range is generally between 15 and 17 years.

Most firms follow this first examination with a basic course on precision mechanics lasting about six months. Only then do the students enter the apprentice workshops. After learning their materials and future tasks, the apprentices must try their skill on various machine tools. Finally, after two years, the apprentice must be able to make complicated (Continued on page W-28)

PRODUCTS



More and more camera owners say:

„You're Shutter Sure,




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Every PRONTOR shutter is a fool-proof, precision and quality product. 55 years of experience in shutter manufacture guarantees that PRONTOR shutters always incorporate the latest technical improvements as well as simplicity in handling.

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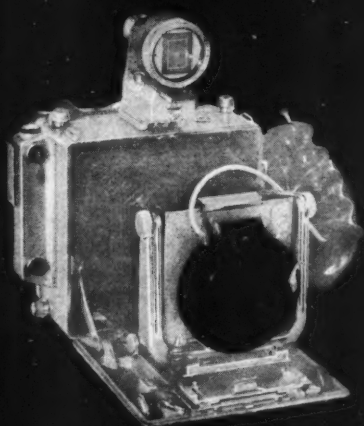
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The makers of such superb cameras as Linhof, Arriflex, Polaroid Land, Kodak (West Germany) Bauer and Nizo depend upon the 80 years of optical knowledge and acumen, manufacturing ex-

perience and precision, back of the Rodenstock name. They depend upon the Rodenstock family tradition of quality and design leadership, today guarded by a third generation Rodenstock and 3,500 scientists and skilled technicians who work with tolerances as infinitesimal as 1/100,000 of an inch. You, too, can depend upon Rodenstock for finest results with your still and movie cameras, enlarger, projector and process equipment.



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APPRENTICES (Continued from page W-25)



Precision still depends upon workman's early training.



For 3½ years, apprentices work under skilled instructors.

parts with absolute precision from a drawing, working on his own. He must also be able to carry out simple assembly jobs.

These early activities are, of course, completely unprofitable for the plant. But every firm knows the importance of training an apprentice in reliability and precision right from the start. Despite the present-day use of automatic machines and lathes, which relieve the operator of much responsibility, the West German photographic industry has not departed from this rule. This policy is the secret of its uninterrupted success, since the value of West German photographic equipment is not dependent upon design progress alone, but also on precision and production consistency.

The uniform training plan, established in West Germany for each profession, also applies to the trades of optician, precision mechanic and toolmaker in the photographic industry. Apart from ensuring near uniform training systems at all firms, this arrangement makes it possible to train a staff which can be moved from one firm to another at a later date.

Once the apprentices are familiar with the machines and their tools, they are allowed to make separate parts for current production. Their working week is 40 hours in length, including the hours spent on training and special instruction. They are also entrusted with small series production of certain items. This helps them to acquire basic skills for filing, drilling, thread-cutting, shaping, milling, turning, grinding and measuring.

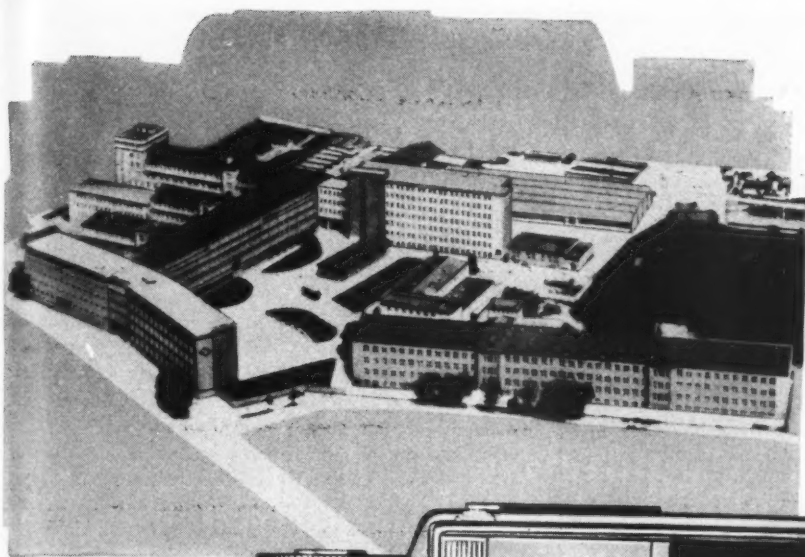
Apart from his normal activities, the apprentice spends at least four weeks in the surface finishing and hardening departments. Here he is always given the feeling that he is making parts or products needed for production purposes and of commercial value to the firm. This serves a double function: providing an incentive for ambition and developing a feeling of responsibility. At this stage the duties for which the apprentice is specially suited are already apparent, as are his capabilities for specialization.

Optical trade apprentices undergo a similar training. They must learn the basic procedures of glass cutting, shaping, grinding, smoothing, polishing and centering the workpiece to exact thicknesses. They must also know the production of lenses and prisms. Their final examination usually includes the production of a complicated combination of glass prisms with ground spherical surfaces and some cemented lenses.

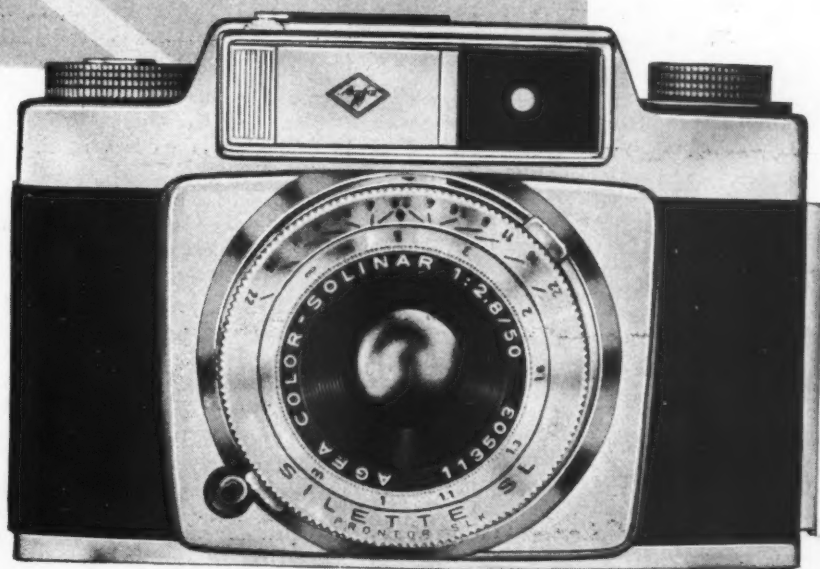
The assignment to new duties always depends on intermediate examinations. Here not only the opinion of the instructor counts, but the apprentices themselves are expected to criticize and judge their own work.

The marks obtained from these tests are always entered on a report sheet kept by the instructors for each apprentice during the period of his apprenticeship. The apprentice also keeps a book in which he records all he has seen and learned. In this way he is forced to think and reflect about the work he has carried out. This report book is checked regularly and

(Continued on page W-32)



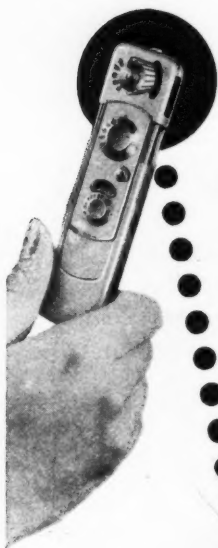
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Agfa Silette SL with automatic exposure coupling



At the Agfa Camera factory, Munich every conceivable modern aid in process technique and organisation is available to the 4000 employees of the firm. Experience in camera design over many decades, systematic research and development, extreme precision in camera and lens manufacture as well as careful controls of the finished product have won the Agfa Camera factory the confidence of photo enthusiasts the world-over. There are Agfa roll films and miniature cameras to suit all tastes, at prices ranging from DM 14.- to DM 315.-, including the Agfa Silette SL - an entirely new achievement in camera design: the first camera with automatic exposure coupling!



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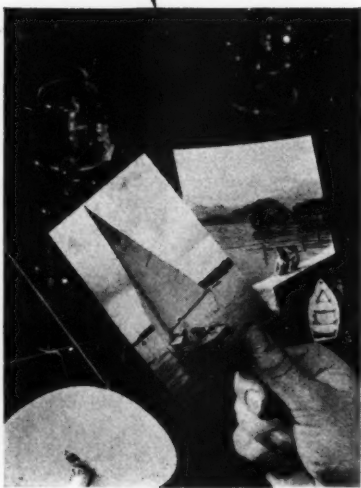
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Built-in coupled exposure meter with two measuring ranges—Sliding blade shutter $\frac{1}{2}$ to $\frac{1}{1000}$ second, B, T, with flash synchronization—15 mm f/3.5 Complan 4-element lens always works at maximum opening—Extreme depth of field—Focuses from infinity to 8" closeups—Telescopic Rapid Shutter Cocking and Film Transport—Exposure Counter—Two built-in filters—Built-in lens shade

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PHOTOKINA (Continued from page W-3)

Of course, the hottest question is: What will be *new* at Photokina? It would seem to be easier to get top secrets out of the Pentagon than out of the photo industry. Certain trends, nevertheless, are apparent, as far as the West German photo industry is concerned. They are in the direction of more and more automatic exposure devices actuated by, or related to, built-in photo electric cells; also, more and more lens interchangeability and a constantly improving lens quality where evenness of field coverage is being stressed and extremely fast lens speeds subordinated.

On its cultural side, Photokina will again offer a variety of picture exhibits, both still and movie, demonstrating the many applications of photography. Seventeen of these shows have been announced for 1958.

In contrast to the American scene, where trade fairs are appendices to the yearly dealers' conventions, Photokina has always been a trade fair and picture exhibition in its own right, organized by the West German photographic industry jointly with the Cologne Fair and Exhibition Corporation. The photo industry determines overall policy, whereas the Exhibition Corporation runs administrative and financial details.

L. Fritz Gruber, Photokina's Executive Director since 1949, is the person who is responsible for bringing the heterogeneous elements of Photokina into a workable whole. While Photokina is primarily a trade fair, the directors also want to attract the general public.

It is now ten years since the idea of Photokina was begun. After the currency reform in West Germany in 1948, the photographic industry was unwilling to exhibit at the Leipzig General Fair, held behind the Iron Curtain. They chose Cologne as a site, both because of its central location and because of the giant exhibition halls ideally situated on the Rhine River bank across from the famous Cathedral.

The first Photokina, in 1950, confined to the products of the West German photo industry alone, turned out to be a tremendous success. The non-German photo producing countries immediately asked to participate in future shows. So from 1951 onward Photokina became a photographic world's fair on German soil.

The West German industry has invited and is still inviting on an equal basis all international competitors who believe in, and act according to, decency and fairness in business. Moreover, West German manufacturers know that they can only profit from competition.

Photokina was thus created and is being operated in the spirit of international understanding, promoting photography as a hobby, as a service to science and industry, and as a business. The World Exposition of Photography and Cinematography will be opened by the President of the Executive Council of UNESCO, Vittorino Veronese, and by the President of the German Federal Republic, Professor Theodor Heuss on Sept. 27, 1958. Photokina will be the nine-day wonder of photography and cinematography!—THE END

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*a new series of sensational lenses which are recognized
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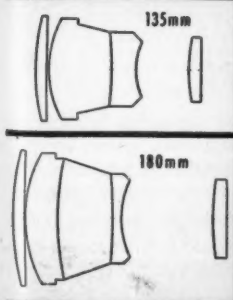
• With these two incredibly precise new lenses, and more to follow, Isco brings to Exakta camera owners a new series of "miracle" lenses that optical science has not been able to produce until now! Small and compact, the Tele Iscarons are **TRUE TELEPHOTO LENSES!** And although small in size when compared with other lenses, they are large aperture, fast speed objectives that assure the critical Exakta user far better results than was ever thought possible!

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• You'll get highest quality pictures with Tele Iscaron lenses! Be sure to ask your Exakta camera dealer to show you these exciting new lenses from Germany's world-famed optical laboratory!



**NEW,
EXCITING
LENS
FORMULAE!**



ISCO

OPTISCHE WERKE KARL DÖTTINGEN

APPRENTICES (Continued from page W-28)



West German apprentices are chosen from a very young group. Usually age range is between 15 and 17 years.

is also considered in the final examination grading.

In addition to the practical work performed in up-to-date apprentice workshops, the technical and theoretical side of photography always occupies an important position. Particular emphasis is placed on a photo-technical education. All apprentices must acquaint themselves with photography, optics and cameras in particular. In addition to increasing their technical knowledge, this strengthens the feeling of association with the products manufactured by the various plants.

In some firms monthly discussion groups are arranged for further education of a general nature. The object of these sessions is to introduce the young people to the community in which they work and to acquaint them with conditions in the plant. This encourages the apprentices to become responsible, cooperative and creative members of the firm.

Occasional gymnastic and swimming training under the leadership of a sports instructor provides physical recreation and helps eliminate any defects in regard to personality development and deportment. Some firms also take their apprentices on conducted tours of other plants, usually suppliers or firms belonging to the raw materials industry. Twice a year there is an organized outing for the apprentices.

During the final eighteen months of their training, future specialists pass through different departments of the firm in order to get to become familiar with the various operations and to obtain a general picture of

the plant's organization. Everywhere they go specialists are on hand to advise them. These are men who have been with the firm for many years and who possess great practical experience. They also provide good examples because of their own accomplishments.

The 3½ years of training concludes with a specialists' examination set by the Examining Board of the relevant Chamber of Industry and Commerce. The regulations for this final examination stipulate that it must never be undertaken at the apprentice's own firm. If he passes, the apprentice receives a skilled worker's diploma showing his marks for practical skill and theoretical knowledge. Apart from this, the apprentice receives a testimonial from his firm containing the usual particulars regarding his period of apprenticeship, his conduct and technical ability.

This is by no means the end of his training. Every young apprentice, who receives skilled workers' rates of pay after finishing his apprenticeship, has the chance to take a further course of instruction given in and outside his firm. After a few years of practical work, capable and ambitious young men attend evening classes at technical schools. Attending these courses (ten hours of instruction per week for three years), they acquire the knowledge needed to become a "state-tested technician."

Thus the West German apprentice system serves its photo industry as the key to the continuing production of precision equipment and materials.—THE END

100



Oct

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the MOVIE MAKER

by MYRON A. MATZKIN

Protect your film the easy way—
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Just looking at
all the film you
shot last summer
is liable to con-
jure up visions in
your mind of tan-
gled, mutilated
and trampled
movies—based on
what happened
the last time you
tried editing a

large amount of footage.

It's almost enough to make you decide that perhaps leaving the film on the 50 or 100-ft. projection spools provided by the processor isn't such a bad idea. Actually, editing can be an orderly, enjoyable part of movie making—provided you adopt a few procedures for organizing and safeguarding your film.

Naturally, the first thing you ought to do is take a look at all the footage. Unless you carefully scripted your summer shooting, with a definite film idea in mind, you probably have forgotten how individual scenes relate to each other.

Note scenes and sequences of shots in all the footage. Decide right there whether you have one, or several, films in the making. For example, it may be awkward to splice your daughter's birthday party with a vacation shot of the Grand Canyon.

Now, put the film aside and forget it for the moment. Take a quick survey of your editing equipment. Can you sit down and cut film and be sure that it won't be scratched or dirtied? Is your splicer properly aligned? A poorly aligned machine means splices that will flash on the screen—or worse, splices that may not hold. Check the emulsion scraper, if your splicer has one. Many of the built-in scrapers either get dull or clogged with old emulsion. I prefer to use a single-edged razor blade instead of a built-in scraper. It makes a quick, clean scrape, with a little practice.

Clean your viewer with a camel's-hair brush. Old emulsion clogged in the gate or sprocket wheels can scratch films.

(Continued on page 150)

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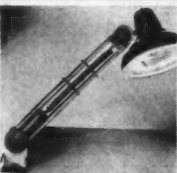
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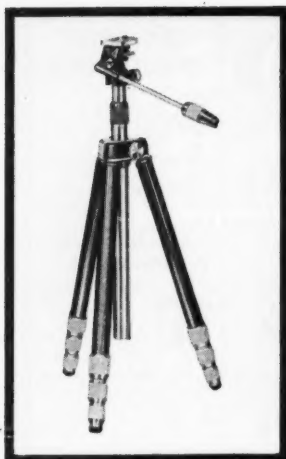
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THE MOVIE MAKER

(Continued from page 148)

And finally, look around for sharp corners that might snag or scratch film. If you can't remove them, try finding another location for your editing bench.

Film Handling

As long as you keep your film on reels—untouched and unused—nothing much can happen to it. But if you're going to do even the smallest bit of editing, the film will have to be cut into scenes and shots. Once that starts the film is in danger of abrasion, dust, dirt, trampling and various other major and minor accidents. Actually, it doesn't have to be that way—if you provide yourself with a film barrel. A film barrel is a cardboard or wooden barrel lined with lintless cloth, and a rack suspended over the barrel mouth by two arms. Pins driven through the rack hold film by the sprocket holes and the ends of the film trail down into the barrel. As you cut a scene to proper length, place it on the pin—safe from harm.

If you don't have room for a barrel, a clothes line strung across the room will do. Hold film on the line with safety pins through the sprockets.

You can make a film barrel, which can be stored easily, out of a folding cardboard box. When you finish with it, fold it and put it away—or if you won't need it for some time, throw it away and make another one for your next editing job. I don't like the idea of using egg cartons, cigar boxes or other compartmentalized containers for holding film lengths. Rolling up the film tightly to fit the compartments may cause irreparable scratches.

Your fingers can cause damage to film emulsion, too. Fingers can leave marks and dust-gathering oil on film surfaces. Rough hands can scratch footage. Wear editing gloves. If you can't buy them in your local photo shop, try the thin white dime-store cotton gloves worn by women to protect their hands after applying skin creams.

If you can afford it, avoid working on your original film. Instead, have a work print made—either black-and-white or color. You can cut costs by getting a work print of only the shots you're sure are good enough to include in your film. Do all the editing on the work print and then match the original to it.

If you must work on original film, handle it as little as possible. Decide how you want to cut your movie beforehand. The less you handle the film, the less chance of damaging it.

—THE END

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MODERN TESTS

(Continued from page 103)

on the screen. In actual photometric tests, it produced brilliance equal to that of the 500-watt machine with standard bulb, condensing lenses and reflector.

The Argus lens, which was slightly short in focal length, produced a larger image at shorter projection distance, a capital idea for small rooms where you often can't get back far enough to fill your screen with the image. The lens was of good overall quality.

Controls on the projector are extremely simple. There is but one speed—16 fps. If you have one of the new single speed electric eye cameras, you'll find this no disadvantage. The still projection mechanism benefits from the low wattage lamp. Even when a single frame is left in position for as long as five minutes, it doesn't overheat.

The M500 threads easily, rewinds quickly and is slightly noisy during projection.

Nylon gearing within, a die-cast aluminum body, and scuff-proof vinyl finish ought to give it a long and happy life.

It's a relief in the days of longer and larger cars to find that some good things do come in smaller packages.

—H.K.

WIDE, WIDE-ANGLE KINOPTIC 5.7MM

Specifications: Super wide-angle fixed focus apochromatic lens for 16mm motion picture cameras. **Elements:** 6. **Overall length:** 6 in. **Aperture range:** f/1.8-f/16; T-stops match openings on other Kinoptic Apochromatic lenses. **Angle of view:** 113°. **Price:** \$499 (D mount); \$529 (Arriflex 16 mount). **Importer:** Karl Heitz, 488 Lexington Ave., New York, N. Y.

It's safe to say that this is one of the most special of all special purpose movie lenses. It just won't do for casual living room-type movie making—unless you want to make a science fiction film out of a birthday party.

It's almost impossible to get an undistorted image shooting at normal subject-to-camera distances. And here lies the chief advantage of a lens like the Kinoptic 5.7mm wide-angle. This is a lens for the experimental film maker. It focuses from almost inches away from a subject to infinity. Near subjects, such as faces, become elongated and noses take on a bulbous appearance. Distant objects seem almost ready to tumble over. For pure

coverage, the 5.7mm is hard to beat. It has an angle of view of 113°. We constantly had to ask people (sometimes standing almost even with the camera) to move out of the way during tests.

The lens is sharp at almost every opening. Some softness, natural in all high speed lenses, was noted at maximum aperture. However, when filming really close to the subject to achieve a large mass on the frame, softness proved hardly noticeable.—M. A. M.

QUICK, MEN, HAND ME AN EXTENSION TUBE

Specifications: Accura Quick Tube extension tubes. **Length:** 5, 15, 30 mm. **Mount:** For Edixa Reflex, Pentacon, Hexacon, Praktica, Contax S, D, etc., with screw threads. **Price:** \$7.95. **Importer:** Photographic Importing and Distributing Corp., Valley Stream, N. Y.

We are totally unaccustomed to writing up extension tubes. After all, extension tubes are solid, all metal or sometimes plastic lengths of precision pipe useful for making close-ups if you have a camera with interchangeable lenses. What's there more to say?

Whoever thought up the Accura Quick Tube had his head screwed on right. (Edixa, Pentacon, etc., thread anyhow.) As anyone owning an interchangeable screw threaded lens camera can testify, changing lenses in a hurry is not one of the screw thread advantages, although it's absolutely true that the screw thread holds the lens very securely.

The Accura Quick Tube—designed to be used with one of the most common single-lens reflex screw threads—has an instant bayonet mount! By shaving off the threads in three equally spaced sections of each tube end, the tubes can be matched and interlocked with a slight turn in about two seconds flat. Moreover, the tubes screw into the full threads of lenses and camera mounts with no trouble at all.

Unfortunately, the instant breech lock mechanism only works between tubes since your camera and lens have full threads which require the entire threading operation. But the Accura interrupted thread should cause some threaded mount camera manufacturers to give a few thoughts to shaving the threads in like manner on the lens and camera lens mount as well.

In addition to the clever breech lock mechanism, the tubes are very well made and nicely finished in dull black metal with heavily knurled finger grips and red matching dots to make interchanging easier.—H. K.



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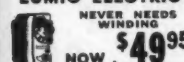
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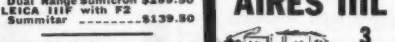


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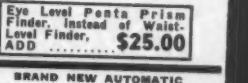


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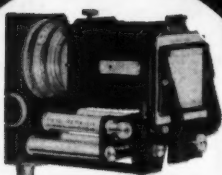
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DISCOVERY

(Continued from page 101)

couldn't talk with the people in their own language. He has found, in places far from home, images and ideas which relate the exotic to the familiar. These are warm and happy pictures of warm and humorous people. The children, page 100 were photographed in a backyard four miles from the Kremlin, not in New York, Chicago or Detroit. The station waiting room, page 101, is in Moscow, not Iowa, Idaho or California. Al Maysles has been able to reach out and communicate with people who are very different from himself in language and in culture. He is not afraid. Equally important: he has had the imagination and ingenuity to travel on his own.

At the time of the first trip in 1955, Maysles was working as a psychology teacher at Boston University. He had always liked to travel, and decided to go to Russia that summer. A shift in Russian policy indicated that Americans might be able to obtain permission to travel in the Soviet Union for the first time since the beginning of the cold war.

The idea of working on a professional project came almost as an afterthought. Maysles determined to investigate mental health and psychiatry in Russia, and to make a film on what he found. There were only two obstacles. Maysles had no idea if it would be possible to get into Russian mental institutions, and he had never used a movie camera in his life.

Actually, there was a third problem. Money. Some was saved, but not enough to pay for travel, film, and still and motion picture equipment. Maysles made a series of hitch hiking trips to New York from Boston, in an attempt to promote some financial return from the proposed trip. He thought about writing a travel folder for a travel agency with "an eye to the future"; but unfortunately, the agencies he contacted did not share his optimism concerning the tourist trade with Russia. He went to a number of magazines in hopes of being able to write and photograph for them; but without professional experience as a journalist or photographer, he could not get any assignments. The editors would be happy to look at any material he brought back, but could not insure use or payment. Finally, he did succeed in getting a \$100 reduction in plane fare, in return for writing a five-story sequence on travel conditions in the USSR for a religious magazine.

Then, on one of the New York trips, Maysles noticed the sign "CBS" on the outside entrance to a skyscraper. In his own words: "It came to my mind that Edward R. Murrow worked there. I walked in and asked for Mr. Murrow. When I got to his secretary, I explained that I had a visa to the Soviet Union and

(Continued on page 156)

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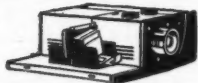
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Fedco Focus Rite Enlarging Aid	2.25	1.75
Fedco No. 100 Dryer 11 1/2 x18	9.95	6.75
Gra Lab #188 Luminox		
Timer	24.95	17.20
Premier A2 Roto Dryer 24x28"	49.95	33.95
Premier A1 Roto Dryer 12x20"	27.50	18.95
Stationmaster 1" Brush	4.95	3.50
Spot-O-Matic Enlarging Meter	15.00	10.48
Nikor 35mm Tank single reel	8.95	6.70
Nikor 120-620 Tank w/Reel	9.95	7.40
Nikor 20 Exp. 35mm wide space reel		4.95
Nikor 36 Exp. 35mm wide space reel, or 620, 120, 127	4.95	3.89
Nikor #33 Tank with 2 35mm reels	12.95	10.70
Morse 6.3 Tank	34.00	23.95
Petuse Scale		9.25

Realist 400	.....	\$16.25
Realist 620 Dualist	.....	\$28.50
Realist 620 for Stereo Slides	.....
Projects one frame	.....
Special (regular 35 as well)	.....	\$34.50
Realist 620 for Polaroid #630 Transparency projection	.....	\$34.50
Stereo Realist F2.8 new	.....	\$107.00
Stereo Realist F3.5 new	.....	\$92.51



OPTIKON 500

New 1958 Model
F2.8 Optikon, 5 Element Brite-Luminous Frame Coupled Rf. Single Window Huge Single View Finder (if you wear glasses, excellent) 1 sec to 1/500 Full Synch, Self timer
List \$69.95 Case \$9.95
Both for ... \$42.95



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Balomat 300	\$84.50
Special	\$58.00
Balomat 500	\$149.50
Special	\$103.00
New Metal Clip Trays \$8.86 Ea.	
Case to hold 24 Trays \$8.72	.....
Case to hold 12 Trays \$4.92	.....

KODAK MOVIE FILM SALE

	Our Price
20 Exp. 8mm Kodak	3.67
36 Exp. 8mm Kodak	3.75
8mm Mag.	3.54
16mm Roll	7.70
16mm Mag.	3.29
8mm Bolex	9.60
Fresh Kodacolor 135mm 20 exp. ea.	1.49
Fresh Kodak 1 year dating, you mail it	
Kodak processor returns your film to your own Mail Box at no charge. Minimum order 3.	

University Camera STORES

NEW BUYS

	List	Sale
Aires Lvs	.....	\$81.50
1.8 w/case \$116.00	.....
Minolta A2	120.00	91.50
w/case	79.95	56.50
Minolta A2	18.50	14.10
Minolta Auto	109.45	74.50
Minolta Lvs	135.45	92.78

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1958 Models*
I w/meter \$78.00
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Latest Model New w/F3.5 Schneider Xenar lens speeds, 1 sec. to 1/500. Synchro Fully interchangeable Self timer Parallax corrected.
Free literature on request.
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"Vision Aid" like Arm rotates 360°, retracts to 28" stamps on desk full globe swivel, lights fluorescent 22W, 60W, or both. Free literature. AC

\$28.76 including lamps

Trays For All PROJECTORS W/COVERS

28c ea. Except Reverse, S&L La Belle
Trays for Reverse 48c ea.
Airequipt Mags \$1.44 ea.

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All New

	List	Sale
FR 140	\$20.95
Ultrablitz Jet	60.95
Hirshy 700 Del	60.95
Ultrablitz Cornet	55.75
Meenblitz 100	40.95
ULTRABLITZ—		
Supreme	\$119.70
Rocket WL	61.50
Meenblitz 100	34.50

Latest Models

	List	Sale
Praktica FX3 w/auto f2.8	\$170.50
Carl Zeiss Tessar	\$99.80
Praktica FX3 w/f2.8	140.50
Westanar auto	89.80
Praktica FX F2 Bio Auto	299.50
Praktica FX F2.8 Yess Auto	193.50
Edixa Reflex w/F2.8 Schacht	
Trevanor Automatic w/wal Level	109.50
Edixa Reflex F2.8 Steinheil	78.00
Special	186.75
Bounce Lite Folding BC	9.74
Flashgun w/bat.	
Brand New Nikon S2	209.00
w/1.4 Nikkor	



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Complete ASA index. Lens stops F1.1 to F32. shutter speeds 30 sec. to 1/1000 sec. Complete with Booster, Leather case and Strap. Polaroid scales.
Reg. \$12.95
\$6.75
Clip-On \$4.95
w/no booster

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	List	Sale
1 1/2 F1.9 Focus-ing	\$38.75
6.5mm F1.9FF	44.50
1 1/2 F1.4 Focus	49.50
6.5mm F1.2 FF	59.95
5.5mm F1.4	119.50
(1 1/2" F1.9 Focus Stand Your lens plus \$15.00)	

TRIPODS on Special & Brand New

	List	Sale
STAR D CONQUEST (elevating type)	21.50
Quickset Champ II	34.00
DELUXE TRIPOD CASE	25.95
Star D Cont Mark III	25.95
Quick Set Husky II	47.00

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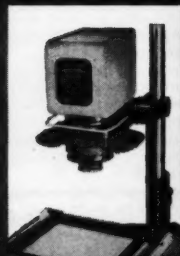
(Continued from page 154)

that I was going there to inspect and photograph their mental hospitals. Mr. Murrow was away. I saw a Mr. Daly, who appeared quite interested. I told him frankly that I had never taken motion pictures before... but that I was sure I could learn in the day or two left before my flight. Actually, I had taken a lot of still photographs with a borrowed Leica. I showed him these. He consulted with the Chief of the CBS Foreign News Section who liked the idea of taking movies in Russian mental hospitals. An agreement was reached: CBS would loan a camera, provide some film, and pay for any footage they could use. They handed me a camera and film on the spot, and told me to go out and practice. The film was processed, projected and criticized the next day, and arrangements were made for me to pick up a batch of film at La Guardia Airport in the 20 minute layover that my plane would make en route from Boston to Europe. On August 15, with a few items of clothing and 40 pounds of photographic equipment stuffed into a pillow case, I left for Helsinki."

That's how Al Maysles left on the first trip. Once inside the USSR he did manage to gain admittance to the mental institutions. He was allowed to question and to photograph as he had hoped. Parts of the film were used by CBS, and this, together with other pictures and articles, paid for a large part of the trip.

The next year, in the summer, Maysles traveled in Italy, Austria, Czechoslovakia, Poland and Russia—aboard a motor scooter given him by the manufacturer. He collected more material on mental health, and, again, filmed in hospitals, and took a lot of general photographs. In 1957 he spent nine months in Yugoslavia, Hungary, Czechoslovakia, Poland and the USSR, accompanied by his brother, Dave Maysles. Two days from the time of this writing, Al Maysles embarks from Idlewild for Turkey, Lebanon, Russia, and—if he gets the visa between now and then—Outer Mongolia.—P. C.

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- Two aluminum 10" reflectors for #1 or #2 bulbs
- One bullet reflector for spot effects

All three complete with swivel joint, switch, socket, clamp and cord... at a fraction of their usual cost. **Shipping Weight 3 lbs.**

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For the advanced photographer who needs hand or foot push-button control for all his lights. 4 Outlets, each separately controlled with pushbutton switch. When bought alone \$4.95. **Ship. Wt. ea. 2 lbs.**

Compose and focus in comfort, save electricity, prolong bulb life, retain subject's natural expression. Nothing like it under \$5.00. When bought alone \$2.95. **Ship. Wt. ea. 2 lbs.**

PHOTOFLOOD STAND PLUS TWO REFLECTORS

- 3-section metal stand extends 6'4"
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- Stand telescopes compactly to only 2 feet
- Positive locking at any desired height

The ideal indoor lighting setup. 22" crossbar, can also be used to hold screen, backgrounds. Two-spun aluminum 10" reflectors for #1 or #2 photofloods, complete with sockets, switches, 6 cords, ball socket swivel joints, rubber lined spring clamps. Can be used on cross bar or furniture. **Shipping Weight: Stand & lbs.; Reflectors 6 lbs.** Extra clamp on ball with bulb for semi-spot. **1.90** A photoflood stand with reg. crossbar \$4.48. w. swivel crossbar \$3.98. **BOOMLITE ATT. 8 ft., adj. swing. List \$3.95; if bought with above \$4.98.**

\$13 VALUE **\$7.89** **Now with NEW SWIVEL CROSSBAR**

Save 50% off list on the meter that has everything

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Super Sensitive photocell reads reflected and incident light; settings for all shutters, incl. movie, Polaroid, LVS, EVS; ASA range from 3 to 3200; 1 stop range from 1 to 32; shutter speed range: from 1/1000th to 16 seconds. **SH. Ch. 35c** Extra Sensitive booster with incident attachment, for poor light readings. **List \$3.50 only \$1.75**

Famous Make CLIP-ON PHOTO-ELECTRIC METER

Fits accessory clip of all popular 35mm cameras. ASA speeds to 800, 1 stop range to 32, speeds to 1/1000th, incl. leather case and strap. **List \$9.95. \$5.25** **Ship. Chgs. 30c**

A DREAM CAN BE TRUE! POCKET ELEVATING TRIPOD

The two most desirable features incorporated into one tripod: 8 sec. pocket size (only 11" and 16" rise) elevator action, with a positive lock. Ribbed top section, chrome plated brass legs extend to 44" (+/- elevation), single action 90° tilt and panhead—ideal for every movie, twinlens, 35mm film. **Model EL-OP. \$8.66** **INCLUDING PANHEAD** **Luxurious Leather case \$1.79 extra.**

For "Quick" Panhead, with rapid camera on-off feature, \$4.50 list, only \$1.48 extra.

GEARED DRIVE MODEL, ask for model EL-GP and add 80c to cost.

BOUNCE FAN FLASH

Not \$14.95, nor \$11.95—but only \$5.77 is Spiratone's price for a famous make fanflash with built-in bounce! Look at all these features: 6" fan reflector, extension outlet, ejector, BC capacitor, bulb-battery tester, exposure dial, interchangeable cord—plus bounce feature! **Luxurious leather case 69c; Extra long coiled cord 39c (extra); Extension Bounce Fanflash \$5.95; Bracket for use of gun on side of camera \$1.00; BC battery, lasts full year \$1.00; Synchronizer for old cameras \$2.49. SH. Ch. 40c**

BOUNCE OUTFIT A: Bounce Fanflash, leather case, BC battery, coiled cord—all for \$7.64

BOUNCE OUTFIT AB: Outfit A, plus Extension Fanflash (List \$17.00) \$9.95

2 SENSATIONAL SAVINGS ON 2-POCKET PIGSKIN GADGET BAGS

The new Spiratone Two-Pocket Genuine Top-grain Pigskin bags are really what you wanted: they have handy wrap-around zippers, adjustable straps with shoulder pads, zippered filter pocket inside cover, chrome hardware, tripod holders on the bottom and two outside pockets for easy separation of accessories. And the prices are lower than those of plastic bags!

'Standard', 10 x 8 x 4".....\$6.88 **'Giant', 12 x 9 x 6".....\$10.88** **'Medium', 11 x 8 x 5 1/2".....\$8.88** **'Professional', 16 x 11 x 6".....\$14.14** **Deuxe style only**

DELUXE Two-Pocket with these extras: Velveteen lining, 2 more inside pockets, add **\$1.25** per bag

Every Movie Fan Needs an AUTOMATIC PANNING \$2.95 ATTACHMENT

Turn handle, and gear smoothly pans your camera, for those really professional panoramic movie scenes! Fits below or on top of your present tilttop or panhead, works with any camera, any tripod. Calibrated in degrees. This feature is incorporated into professional panheads costing \$30.00 and more, was never before available to amateurs.

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We are proud to present three unusual values in brand new, coated, color-corrected, anastigmatic lenses, specially constructed to give corner to corner sharpness in enlarging—at prices far less than those you'd expect to pay for such sharp-cutting lenses. **Sh. Ch. 25c** **2 1/4" f.8.8, clickstops, for 35mm.....\$7.95*** **3 1/4" f.4.8, clickstops, for 2 1/2x3 1/4".....9.95*** **5 1/4" f.4.8, clickstops, for 4x5.....19.95** ***Precision Flange for easy fitting to lensbar.....1.25** ***Sensational, new illuminated diaphragm feature—add \$1.75** **2" Diaphragm Condenser, for 35mm.....\$2.95**

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Double zippered inner and outer bags—made of the finest cloth—100% light proof even in brightest sunlight. Whether for use in an emergency, as a film turn or pulled off the spool in a 35mm camera, or for reloading cut film holders or for developing film when no darkroom is available—the changing bag is justly referred to as a "portable darkroom." 17" x 16" working space plus elastic sleeves. **Shipping Charge 35c** **\$3.95**

ELECTRIC 2-SURFACE ALL METAL DUD-DRYER

PROFESSIONAL MODEL: 27x30" working space.....\$6.95 **SH. Ch. 50c** **EXTRA LARGE MODEL: 30x44" working space.....\$9.95** **SH. Ch. 75c**

ENLARGING TIMER

60 sec. range, with second markings. Current shuts off automatically at end of desired time interval. Built-in lock holds knob at desired position, until toggle is released. Adjustable stop for repeat exposures. Manual operation for focusing. Enlarger or printer plugs right into receptacle on camera timer. **Ships. Chgs. 40c.** **\$6.95**

PRINT WASHER

Converts sink or tub into efficient washer—fits any faucet. Won't rust. Washer items add \$2.50. **SH. Wt. 2 lbs.** **\$1.98**

STATIC BRUSH

Refractable, emits radioactive rays. To clean lenses, slides negative. **\$2.99** if bought with other equipment

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10x14" 12x17" 18x24" 6 for \$3.4 for \$3.2 for \$3. **Ships. Wt. 6 lbs.** **\$8.98**

ENLARGING FOCUSING AID

Compares w. \$2.25 units. **\$1.00** **SH. Ch. 15c**

8x10 ENAMEL TRAYS

3 for \$3.98 You'd expect to pay over \$2.80 each for these acid-proof trays which Spiratone offers you at less than half the regular value! **SH. Wt. 5 lbs.** **11" x 14" ENAMEL TRAYS \$2.50 each 3 for \$6.50** **18" x 20" ENAMEL TRAYS (Slightly for 12x17, smaller sizes) \$3.95 each 3 for \$19.95** **Ships. Wt. 5 lbs. (3) 12 lbs.**

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Screws into dropcap or outlet. With one filter (specify red, orange, green, yellow). **Extra filters.....88c each** **\$2.49**

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An efficient paper cutter, with ruled hardwood board, hollow-ground, hardened steel knife on spring. **14" Model \$3.98** **Ships. Wt. 5 lbs. & 7 lbs.** **FREE with trimmers, double edge cutter \$5.98**

CUSTOM TRIMMERS, same as above, but with plastic guide rule and built-in drawer to catch clippings, extra price—ask for models PC-Custom 10 and PC-Custom 14, and add only 94c to prices.

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Select as many darkroom aids as you wish. Your order for darkroom items is \$3.98 or more.

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MAGNIFYING HOOD \$2.95 PPD

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Twin magnifier makes possible accurate focusing and composing of entire groundglass image with BOTH EYES and at comfortable distance, while protecting groundglass from glare. Saves eyestrain, helps accuracy, dim light focusing. Instantly removable and collapsible. For Rolleiflex, Yashica, all others.

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A flat thin Fresnel ring plate which fits over groundglass in your reflex camera, greatly increasing brilliance of viewing image, making the often almost invisibly dark corner image ten times brighter! No installation—just drop fieldlens onto groundglass. Postpaid. For Rolleiflex, Graflex, 22, Ciroflex, Yashica, Minolta, all others.

35MM TWINLENS REFLEX CAMERAS

Without installation, the Junior Minidapter enables you to use 35mm film in your 120 Rolleiflex, Rolleicord, Ciroflex, Graflex 22, Minolta, etc.—yet, you can change back to your regular size any time you wish. Minidapter comes complete with groundglass mask, card-ridge adapters, counter, ready for use. **Ships. Chgs. 15c** **\$3.95**

SR. MINIDAPTER has additional finder (for vertical and horizontal shots), special bracket for finder and counter. **\$5.95** **List \$8.95**

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Perfect portraits and close-ups every time sets fit cameras without any adapters, are guaranteed to equal \$20.00 sets in performance. #1 set focuses from 38" to 20"; #2 set from 20" to 13". Low \$2.95 price includes 2 close-up lenses, prism. Leather case, single 38c, double 68c. **Coating of taking lens.....50c extra per set** **Shipping Charge 10c**

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At last—an economical type-on mount with 2 1/4" x 2 1/4" in. quantities outside dimensions to fit standard viewers, projectors. Each binder comes complete with two glasses. **SH. Wt. 4, 7, 12 & 36 lbs.** **50 for \$3.85—100 for \$6.95—400 for \$24.00—1200 for \$60.00** **Sample Package of 12—\$1.25 postpaid**

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Fits Rolleiflex 3.5, Autocord, Yashicamat, other bayonets, holds flashgun in ideal position. **COMBI. OFFER:** Flash Mount with BC Deluxe Fanflash, with tester, dial, coiled cord, leather case. **List \$10.95** **Shipping Charge 35c** **\$6.99**

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For Rolleiflex, Rolleicord, Ciroflex, Graflex 22, Minolta, Yashica. **Breaks straight lines at an angle until perfect focus is reached.** **Wonderful for poor light focusing.** **Rangefinder is built into groundglass which replaces your present groundglass. Complete instructions supplied, simple installation for your local mechanic can do it at nominal cost. A "must" for the photographer who insists on perfect focus.** **LIST \$5.95** **\$2.98**

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For Rolleiflex 3.5, Minolta Autocord, Yashica. **ea. \$2.19—3 for \$5.98** **Special Savings: 12 for \$54.95** **Yashica 808, 85C, Skylight.**

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Compensates for difference between viewed and exposed images—works even with extreme closeup lenses! **\$1.98** **List \$2.98**

2 1/4" SQ. NEGATIVE ALBUM

with your order for \$2.95 worth or more merchandise. **holds 100 negatives or transparencies** **\$1.98** **List \$2.98**

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Have your camera when ordering — allow 25c for shipping one lens, 50c for a set.

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MODEL "VI" for **TWINLENS REFLEX CAMERAS** and **RETINA II, III (a, b, c, REFLEX), AIRES III, KONICA, RICOH 500**

EITHER **\$16.95** BOTH **\$29.95**
LENS EA. LENSES

With matching finder, 35mm camera, \$37.95
Complete with deluxe leather case, filterholder, interchangeable adapter — coated color-corrected — no effect on exposure or lens opening.

Lenses are available for Rollei-flex (exc. 2.8), Rolleicord and Minolta Autocord Bayonet — Groflex and Groflex 88 — Rich-flex — Yashicoflex — Waisflex — Autoflex, etc.

FREE with Model VI lens order — two optical glass filters.

MODEL V-C3 for **ARGUS C-3**

Set of Telephoto and Wideangle Lenses, complete with proper fittings, double leather case, retaining ring, coated conversion filter, universal finder, reg. \$37.66

COMB. DEAL **\$27.44**

With Turret Finder \$31.47.

Accessory Clip, for older model Argus C3, \$1.00

SPECIAL with SPIRATONE

TELEPHOTO Lenses **\$2.00** Portrait-Diffusion Disk for these professional looking portraits only



NEW: 1938 model SPIRATONE UNIVERSAL TURRET and CLOSURE
(+1, +2, +3) FINDER
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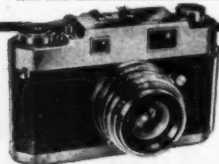
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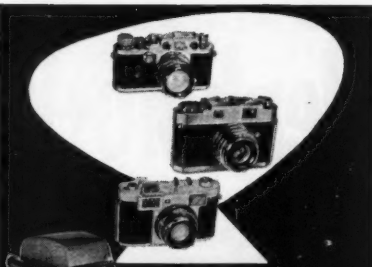
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FAMILY CAMERA

(Continued from page 108)

jects, take your exposure meter reading from shadow areas.

In planning your film, take advantage of the many vivid colors found on the beach—umbrellas, gay towels, swim suits, beach balls. You might show just little bits of a bright color against the white sand, or fill the screen with a huge mass of startling hues, using color as an abstraction.

While we're all for planning a film—at the beach or anywhere else—there are times when you should depart from the script. Some of your best footage will be filmed when people—particularly children—are unaware of the camera. Keep the motor wound and the diaphragm set for the correct exposure.

Shoot faces

Avoid shooting people's backs unless there's a reason for it. If you decide to shoot the kids dashing into the water, get in before they do so that you can film them rushing toward the camera.

Almost everything at the beach can be interesting in a home movie—eating, sun-bathing, burying dad's feet in the sand, playing with the ball, people swimming or fishing. Some of your best shots may arise from things that the children discover for themselves—starfish, seaweed forms, crabs and even jellyfish.

You might want to use the device we adopted in this month's script to maintain continuity. In the first shot we show the children, Jimmy and Pinney, dashing onto the sand—with a beach ball tucked under Jimmy's arm. The ball appears again here and there in the film (but not in every scene). Finally, after the subdued scene of the family leaving the beach, we cut to the ball, deflated and forgotten near a tide pool.

Shooting at the beach requires a bit of additional care for camera and equipment. Sand is one of the great enemies of the photographer—but a few simple precautions will prevent serious damage. Place cameras and other small equipment in clear plastic bags when not in use, and keep them out of the sun. Very important, keep extra film in a reasonably cool spot. If you use a tripod, don't let the tips sink too deep into the sand. Instead, place the tripod on a blanket or towel when you can, to avoid getting grit inside the leg locks. Salt water won't help your equipment much either. A haze filter over the lens will prevent damage and at the same time help to cut some of the atmospheric haze often present close to the shore.—THE END

IN NEXT MONTH'S MODERN

How to deal with the new
superfast films for best results.

PICTURES IN A MINUTE

(Continued from page 46)

ting on the self timer adjustment suitable. All other Polaroid cameras require a shorter pin stroke; around number 4 on the self timer.

Once set for your camera no more adjustment is needed. Screw it into the cable release socket, wind it, release it, walk around into your own



SELF TIMER: Bower self timer screws into cable release socket. Numbers on actuating pin housing (arrow) are used to adjust timer to action of shutters.

picture (you have 15-20 seconds) and pose charmingly. It works equally well with daylight, flash, speedlight.

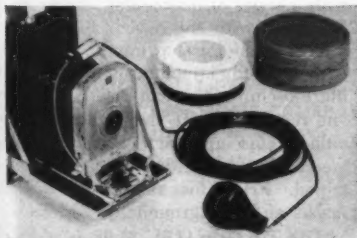
The great advantage of this device, compared to some others, is that it may be reset and used again and again without the nuisance of removing it from the camera to reset it each time.

The Rowi remote control

Even more fun than a self timer is this long distance remote control. Basically, it consists of a cable release attached to a pneumatic piston/cylinder device, connected by a tube to a rubber bulb which you squeeze to actuate the piston/cable release/camera shutter combination.

The tube is long, and with the extension supplied you can be as far as 30 ft. from the camera. The tube can even run under water. With the Polaroid cameras you have to give the rubber bulb a good, healthy, sudden squeeze to actuate the shutter release. Then you let up on the bulb and the shutter resets itself.

The Rowi remote release is made in Germany, imported by Argraph Corp., 115 W. 30 St., New York, N. Y., and the list price is \$10.95. It has been around a long time and I'm sorry I didn't come across its application to the Polaroid camera sooner.—THE END



REMOTE CONTROL: Rowi's cable release/air cylinder device also screws into camera's cable release socket.

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MOVIE ACCESSORIES

(Continued from page 107)

rewind the spring motor of your camera. Practically any 16mm and some 8mm cameras can be fitted with electric motors. The one shown is for use on either Bolex H-16 or H-8 cameras, \$77.50. Others are available for B&H 70, Kodak K-100, and other cameras with provision for hand cranking. However, even 16's without this provision can be converted—at a price.

Actually, there are two classes of motors—wild and synchronous. Wild motors drive the camera at a variety of fps speeds. Synchronous motors are designed for 24 fps only—sound speed.

Three-lens operation (3 and 13, page 107) for single-lens 8mm cameras is possible with a converter unit such as the Ednalite Golden Miracle Dual Lens, \$24.95, (3) or the Elgeet Cine Turret, \$39.50 (13). The Dual Lens has a wide-angle on one side and a tele on the other and threads onto the normal lens. A matching sportsfinder gives the proper field for tele and wide-angle. The Elgeet unit mounts on the normal lens and has separate wide-angle and tele converters on a turret. The converters change the focal length of the normal lens and slip into place like any regular turret-mounted lenses.

The Davis and Sanford 3V Tri-Vision unit (4) makes it possible to shoot titles on live film, make double and triple exposures and other trick effects. The unit may also be used as a matte box (see below) and aligner for close-up work. Has masks for fades and wipes.

Shoulder gunstocks (5) for movie cameras range from something less than \$15 upward. The Bolex unit costs \$89.50 and is designed exclusively for Bolex 16mm cameras. However, other units are adjustable for either still or 8 and 16mm movie units. They provide a solid support for nature filming with very long lenses. Some shoulder stocks have shutter release devices built into them.

A matte box (6) is a mighty handy thing to have on a three-lens turret camera. It does away with changing filters every time you shift to another lens, and also acts as a lens shade. Matte Boxes, such as the National Cine Equipment Co. unit, \$44.95, often have special slots for filters and special effects masks.

Fading devices (7 and 17) make it easy to fade in and fade out scenes right in the camera. The Wollensak unit, \$69.50, (7) opens and closes by a spring, while the Kino-Fader (17) is hand operated. Both use a system of polarizing filters to gradually decrease the amount of light reaching the lens for a fade-out. Fade-ins are made by rotating the polarizing filters in the opposite direction.

A Polarizing filter (8), such as the Enteco unit shown, helps to subdue re-

flections on water and glass surfaces, and is especially useful when filming paintings or still photographs. A small matching polarizing screen indicates the degree of polarization as the unit is rotated. Enteco screens range from \$7.95 to \$19.95, depending on size. Several other manufacturers also produce polarizing screens. Incidentally, two polarizers may be combined into a fader.

The Masmy 8mm Handy Viewer (9) solves the problem of impromptu movie showings. It can be used as a table top viewer to show one frame at a time. Battery operated, it will work anywhere. It's also a handy device for pre-editing processed film. Price is \$9.95.

Accessory finders (10) help to end the mystery of what your camera is actually seeing when using a lens for which your regular finder doesn't show the field. The Elgeet Wide-angle View-Scope (10) can also be used with anamorphic lenses with the proper field mask. Price is \$6.95.

C mount adapters for Leica lenses (11) make it possible to use a wide variety of Leica lenses on your 16mm movie cameras. Sells for \$4.50. Adapters are available for Exakta lenses, too.

Extension tubes (14) on an 8 or 16mm camera bring you within less than an inch of your subject—and fill the frame. The unit on top is an adjustable one used on Camex Reflex 8mm cameras and sells for \$29.95. The lower unit consists of several sections. Number of sections used determines how close you can get to subject, degree of magnification.

Bolex units fitting most movie cameras with interchangeable lenses are priced at \$14 for the 8mm D mount unit and \$15 for the C mount 16mm set.

Elgeet Cineflex (15) ends parallax error when shooting extreme close-ups, titles, or any other movie subject where extremely accurate framing is important. The unit mounts on the front of the lens and lines up with the lens axis. Eye-level viewing is through a finder mounted on the unit, with etched fields for 20, 25, 50 and 75mm lenses on the 16mm unit and 10, 13, 25 and 38mm lenses on the 8mm model. Price of either 8 or 16mm unit is \$9.95.

A titler (16) such as the Brownie Movie Titler serves a dual purpose. It's fine for making unique titles at home with a series of masks and backgrounds furnished with the device, and also as a focal frame for showing the exact field with close-up attachments when shooting close-ups. You can also shoot titles and regular footage simultaneously. For either close-ups or outdoor titling, mount the unit and your camera on a tripod. Price for the Brownie unit, masks and backgrounds, is \$15.95.

The Zip Grip (18), \$4.95 is a quick release unit for attaching and detaching your 8 or 16mm movie camera to a tripod panhead. Costs \$4.95.—M.A.M.

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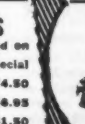
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HOW TO USE LENSES

(Continued from page 91)

the picture corners at full opening. Now let's turn to the longer than normal focal length lens and see what's happening with them.

There is a definite trend to the longer focal lengths today. Ten years ago a tele or long focal length lens, even among the professionals, generally meant a 90 or 135mm. The 90 was used mostly for portraits. You could get a good head and shoulders with little chance that apparent distortion would make arms, hands or noses look larger than they should. The 135mm was used principally for making big images from distant subjects. Then a shift began. The 135mm began to be used for portraits. The longer focal length lens at wide aperture could pick a subject out of his surroundings, and the limited depth of field when shooting fairly close to a subject isolated the person from the background, no matter how confusing or complicated it was. Photographers who simply didn't have the time (or often the inclination) to ask a subject to move, shot him or her where each stood. The resulting candid or non-candid portrait looked as if there had been no background at all. (picture bottom, right, page 91). By moving back even farther with the 135mm, photographers tried the lens for head-to-toe portraits where they wished to bring the background close behind the subject (the beautifully grained wood office wall behind the architect, for instance). At the farther distance, depth of field, of course, was greater, and there you had it, a new way to look at people in offices or homes (provided, of course, rooms were long enough for you to get back that far with your long lens).

It wasn't too long before photographers began casting about for something a trifle longer. The new portrait lens for many today is the 180mm. Light lenses and single-lens reflex cameras or reflex housings for rangefinder cameras can be hand held even at 1/25 sec. A crowded room becomes a virtual sea of faces from which you pick and choose with a 180mm lens. With narrow extension tubes between the lens and camera body you can focus a long lens closer than its normal close focusing distance. No week seems to go by these days without some Congressional inquiry in Washington being seen in *Life* magazine through giant, extreme close-ups of the witnesses, the congressmen or senators and the investigators. How are they done? Long lenses, fast films.

When photographers reach the 180-mm level, they begin to wonder just how long a lens they can hand hold and still keep steady. Today, a 300 to 400mm lens is not unusual. Even advanced ama-

(Continued on page 166)

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HOW TO USE LENSES

(Continued from page 164)

teurs and semi-professionals are using them. These lenses are a trifle too long for portraiture. Of course, these long lenses are still terribly useful for such subjects as architecture (pictures, page 89). However, until you've gone hunting birds or people with a 300mm handheld lens you haven't really learned how exciting interchangeable lenses can make photography.

Except for the need to hold a long lens extremely steady (try thinking of it as target practice with a precision rifle), there's little optical trouble in store for you. The only apparent distortion, of course, is the shortening of distances in depth (called fore-shortening) which makes subject matter appear jammed together. Sometimes, as on a crowded beach, this fore-shortening can make your picture more interesting. If you don't want any people but your actual subject, just open your lens aperture and they'll be so out of focus at f/3.5 or f/2.8, you won't even notice them.

How about the lenses over 400mm? You'll have to go back to a tripod. The lenses of 500, 600, 800 and upwards are not for hand holding. In our experiments here at MODERN we found lenses up to 800mm not too hard to use provided you own a really steady heavy tripod. At 1000 and 2000mm, our troubles began. The slightest breeze caused enough camera and lens movement to blur the picture. A tiny bit of haze, even on a brilliant day, made sharp pictures difficult. At 2000mm, heat waves and air turbulence which you can't even see with the naked eye made the lenses almost impossible to use. Objects seemed to undulate like flags when seen through the waves of heat rising from the ground between the lens and the object.

In the longer focal lengths, 1000 and 2000mm, you have your choice of either straight glass optics or mirror optics. The mirror lenses are much like the large reflecting telescopes used at the larger astronomical observatories. Using mirrors instead of glass, their physical size has been reduced considerably. The regular lens, at 1000 or 2000mm is impressively long and rather cumbersome. Optically, both are about equal in quality.

Rather than make any statements as to how sharp your interchangeable lenses should be, let's suggest that you read "Who's Ahead in 35mm?" on page 56, where various lens tests are mentioned. Taking pictures, of course, is the final test of any lens. However, when buying a lens, don't assume just because it fits your camera that it is accurately aligned. Ask your dealer or repairman to check it for you. There are plenty of photographers around cursing

(Continued on page 170)



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Fast, fine grain, B & W panchromatic ASA 50. Prices include new fast processing service.

8mm x 25' dble. roll	\$1.10
ROLEX 8mm x 100' dble. roll	3.50
16mm x 50' mag.	1.75
16mm x 50' mag. Kodak Super XX	2.25
16mm x 100' Anso	2.75
16mm x 100'	2.50
16mm x 100' Kodak Plus X	2.95
16mm x 100', Sound, ASA 50	3.40
16mm x 50' roll, Plus X	1.50
16mm x 100' Kodak Super XX ASA 100	2.95
16mm x 100' Sound Perf	3.25
16mm x 100' Tri X Sound Perf	5.25

CUT FILM HOLDER

Fits all Graphics and other cameras with standard press-type spring backs.

Standard	Double	Spec.
3 1/2 x 2 1/4	\$ 3.85	\$ 2.79
3 1/2 x 2 1/4	3.90	2.89
4 x 3	4.15	2.99
5 x 7	4.71	3.39
5 x 10	13.00	10.40

* No Minimum Required
***4x5 CUT FILM MAGAZINE—
AWON SPECIAL—\$18.95

AWON CHOPS KODAK PRICES

ALL BRAND NEW—Awon dares to discount even Kodak Equipment—Order Now!

KODAK CAMERAS	LIST	AWON PRICE
KODAK SIGNET 50 35mm, w/flash	\$ 82.50	\$ 59.95
KODAK RETINA IIfc 35mm, w/frame finder	112.95	112.95
KODAK RETINA IIfc 35mm, f2 w/case (discontinued)	112.95	74.60
KODAK STEREO outlt	89.50	87.50
KODAK DUAPLEX IV flash outlt	25.25	18.95
BROWNIE HAWKEYE flash outlt	15.25	11.50
KODAK STARFLASH flash outlt	9.95	7.10
KODAK PONT 135 model C, f3.5	36.50	27.00
KODAK PONT 135 model IV outlt	38.40	41.95
KODAK SIGNET 40 35mm, w/flash	62.50	45.95
KODAK RETINA REFLEX 35mm, f2 w/case	139.95	139.95
KODAK MOVIE CAMERAS		
KODAK BROWNIE 8mm model II, f2.3	29.95	21.00
KODAK BROWNIE 8mm model II, f1.9	39.75	29.95
KODAK BROWNIE turret 8mm f1.9	74.50	52.95
BROWNIE 8mm turret, f2.3	36.50	41.95
KODAK MEDALLION 8mm mag. f1.9 foc.	134.50	79.95
KODAK K100 16mm f1.9 lens	239.00	232.75
KODAK K100 turret 16mm f1.9 lens	337.00	332.75
KODAK PROJECTORS		
CINE KODAK Showtime 8mm projector	123.50	84.95
CINE KODAK Showtime w/variable speed control	139.00	96.95
BROWNIE "500" 8mm movie proj.	54.95	49.95
BROWNIE "500" 8mm movie proj.	79.50	67.50
KODASCOPE ROYAL 16mm movie proj.	205.00	221.25
KODAK "300" 35mm slide projector		
w/readymatic changer	64.50	45.50
KODAK "300" w/Airequip changer	74.50	52.50
KODAK "500" w/Airequip changer	87.50	67.50
KODAK Cavalcade Proj. #500	140.50	109.95

Ask for the AWON DISCOUNT PRICES on all equipment

MOVIE—QUANTITY DISCOUNTS

8mm ASA 50 REVERSAL NO PROCESSING

SIZE	54 Rolls	27 Rolls	15 Rolls
16mm x 50'	19.95	10.95	5.95
*16mm x 100'	46.95	28.50	15.95

*On Camera Spools

Black & White Movie Film Processing Service

8mm x 25' Dble. \$.55 ea.
16mm x 100' \$1.00 ea.
16mm x 50' \$.65 ea.

ASA 50 Aero Ektachrome

35mm x 20 exp. \$4 for \$3.00
Processing included

35mm x 40' Bulk \$3.95 35mm x 75' Bulk \$ 7.50
35mm x 75' Bulk plus 4 1/2 gal. devel. kit \$ 8.95

NEW—ANSCOCHROME ASA 100

This is the genuine SUPER HIGH SPEED Color Film 1959 date. Original pack.

LIST	AWON PRICE
35mm x 20 exp. ....2.35	3 for \$5.75
120 roll .....1.75	3 for \$4.10
16mm x 100' roll.....	\$6.95

HIGH SPEED MOVIE

ASA 200, Proc. Incl.
8mm x 25' Roll.....\$3.45 ea.; 3 for \$7.65
8 or 16mm x 100' roll.....\$7.00 ea.; 3 for \$14.20

CHANGING BAGS

Light tight. Permits you to load film holders, developing tank, etc. without a darkroom. Elastic sleeves. Zippers. Large Size (up to 4x5).....only \$3.95
Professional (up to 5x7).....only \$6.95

POLAROID FILM

Close Date

Type 31 (Model 80)	6 rolls for \$ 7.00
Type 32 (Model 80)	6 rolls for \$ 8.00
Type 41 (Model 9A, 700)	6 rolls for \$ 9.00
Type 44 (Model 9A, 700)	6 rolls for \$10.95

Write for AWON PRICES on all POLAROID Cameras and Equipment.

KODAK SUPER XX ROLL FILM

127, 120, 620, 116, 616 **\$1.00**
Respoiled aerial film 6 rolls for

16mm x 400' BULK MOVIE FILM

ASA 24 Single or Double Perforation.....\$6.95
ASA 50 Single or Double Perforation.....\$6.95
SUPER XX (ASA 100) Double Perforation.....\$7.95
16mm x 400' Positive Film.....\$3.95

Negative Safety

Kodak Plus X or Super XX Microfilm, Infrared or Back-ground X.
35mm x 100 ft. \$1.98 ea.

AERO EKTACHROME

Kodak Background X (ASA 24) or Kodak Infrared.....35mm x 200 ft. \$1.50 ea.

AERIAL FILM

In original metal containers.

KODAK XX	KODAK TRI-X
5 1/4 x 20".....79	5 1/4 x 20".....1.00
5 1/4 x 30".....1.00	5 1/4 x 30".....1.25
7 x 18".....1.00	7 x 18".....1.25
9 1/4 x 17".....1.00	9 1/4 x 17".....1.25
9 1/4 x 18".....14.95	9 1/4 x 18".....16.95

ANSCOCHROME, 1959 DATE ASA 32

35mm x 100' (orig factory pack).....\$30.00
35mm x 28' (orig factory pack) w/loader.....7.99
35mm x 20 exp. (reloads).....\$1.35 ea. 4 for 4.98
120 or 620 original pack.....3 for 3.00
16mm x 100' roll (incl. proc.).....\$8.50 ea. 3 for \$25.00
16mmx100', orig package (no proc).....3 for 17.95

35mmx100'—Bulk Film Special!

DuPont Sup. #4, exp. Index-Day 325, Tung 250.....\$30.50
35mm x 100' Kodak Plus X ASA 80.....\$3.50
35mm x 100' Kodak TRI-X.....\$3.50
35mm x 100' B&W ASA 24.....98c
35mm x 100' Kodak Ortho Pos film.....\$1.50
35mm x 100' Anso ASA 50.....\$1.50

MOVIE PROJECTION BULBS

8mm or 16mm (keep a spare on hand) 300 wt—2 for \$3; 500 wt—3 for \$5.50; 750 wt—2 for \$5

35mm x 20 Exp. Cart. (reloads)

Plus X or Super XX or Tri-X or Infra Red or Microfilm } 6 for \$1.50; 12 for \$2.50

BRAND NEW! For 8mm, 16mm and 35mm MORSE G-3 DEVELOPING OUTFIT

List \$34.50 AWON PRICE—\$24.95

Send 25c for complete catalog listing all photo equipment at unbeatable prices!

Flashbulbs

per CASE OF 120

M2 (per case) \$ 8.95
M1 (per case) 7.95
M2 (per case) 11.95
M1 (per case) 12.95
M2 (per case) 12.50
M1 (per case) 15.95

SLIDE MOUNTS

35mm Cardboard Mounts.....1,000 for \$ 8.50
127 & Super slide cardboard mounts.....1,000 for \$10.00
100 for \$1.50
250 for \$3.50
100 for \$3.50
2 1/4 x 2 1/4 Cardboard Mounts.....1,000 for \$27.00

FRESH KODAK ROLL FILM

B&W—Original Kodak package—Fresh—Bargain

127, 120 or 620 Verichrome Pan—6 for \$2.30
35mm x 20 exposures Tri-X or Panatomic X—6 for \$2.70
35mm x 20 exposures Plus X—6 for \$3.90
35mm x 36 exposures Tri X or Panatomic X—6 for \$4.20
35mm x 36 exposures Plus X—6 for \$4.80
35mm x 36 exposures Tri X or Panatomic X—6 for \$5.30

LANTERN SLIDE PLATES

36 glass slides per box

2x2.....2 boxes for \$1
3 1/4x4.....2 boxes for \$1

CUT FILM SPECIALS

4x5 Kodak Infra Red (100 shots).....\$1.00
10x12 E.K. Commercial (10 shots).....1.98
11x14 Contrast Proc Pan (10 shots).....1.98
4x5 Anso Proc (25 shots).....3 for \$3.90
8x10 E.K. Contr. Proc Pan or Anso Proc (25 shots).....\$1.98 6 for \$8.95
8x10 E.K. Infra Red (100 shots).....3.95

COLOR CUT FILM SPECIALS

5x7 Ektachrome (10 shots).....2.95
8x10 Anso Color (10 shots).....3.95 ea. 3 for \$10.00

10x12—Original Box of 10 sheets—98c

Kodak Contrast Process Pan.
11x14—Original Box of 12 sheets—98c
Kodak Portrait Pan.
Kodak Matrix (10 shots) 10x12—98c 11x14—98c

ANSCO B&W MOVIE FILM—ASA 50

16mm x 100'. Original Anso pack. 3 for \$5.95

Include 20% deposit on all C.O.D. orders. All film and paper are outdated and sold as is. All footage approximate. Prices subj. to change without notice.

EXPORT INQUIRIES INVITED!

New! 35mm KODACOLOR

Another AWON first at this low price! Every 35mm camera owner will want to try this exciting new film!

35mm x 20 exp.—
AWON SPECIAL 3 for \$4.50

SPECIAL OFFER—16mm film

16mm x 100' roll Anso ASA 50—
FAST, Fine Grain, Panchromatic, B&W

A-1 Special—\$1.99 ea.
PROCESSING INCLUDED
minimum order 100 ft.

Bulk ANSCO COLOR daylight or Tung. outdated

35mm x 30'.....\$11.95
35mm x 50'.....6.50
35mm x 27 1/2'.....4.00
35mm x 20 exp. in metal cartr.....1.20 ea.
8 for \$5.....12 for \$3
35mm x 50' Tung.....\$4.95
35mm x 20 exp. Tung.....6 for \$4
16mm x 100' Daylight Movie film.....3 for \$11.95
620 Tungsten.....6 for \$ 2.00

Aero EKTACHROME

ASA 40 with 1 1/2 gallon processing kit

5 1/4 x 20'.....\$5.00
5 1/4 x 30'.....\$5.00
7 x 18'.....\$5.00
9 1/4 x 17'.....\$5.00
35mm x 37 1/2'.....\$5.00

EXTRA—Free compensating filter with any of above.
SPECIAL—4 1/2 gallon processing kit \$3.95.

AERO EKTACHROME KITS

ASA 40. Original sealed cartons. 9 1/4 x 40' film, 1 1/2 gallon processing kit, 4 1/2 gal. devel. kit PLUS one color correction & 4 different haze filters.

SPECIAL—\$8.95
5 1/4 x 40' film two 1 1/2 gallon processing kits, & 4 filters.....\$8.00

PAPER SALE

ORIGINAL BOXES
CONTACT PAPER—less than 1c a print

4x5" SWGL (200 shots) #3.....\$1.00
10x10" SWSM #1, 4.....1 box (100 shots) 98c
8x10" LWSM #1.....(100 shots) 1.00
8x10 AZO DW Lustre #3.....(100 shots) 3.50
10x10 SWSM #4.....(250 shots) 1.95
18x22" LWSM #1, 2.....1 box (50 shots) 1.98
Kodak Linagraph 7" x 9".....2.95
Kodak Linagraph, 8" x 20".....1.95
14x17" LWSM #1, 2, 3.....1 box (50 sheets) 1.25
11x14" LWSM #2, 8, 4.....1 box (50 sheets) .98
7 1/4 x 17" SWGL #4 or 5.....1 box (250 sheets) 1.95
10x20" SWSM #3, 4.....(50 sheets) 1.50
8x10" SWSM #1, 3.....(100 sheets) 1.95
10x10" DWSM.....(100 sheets) 1.95
8x10 1/4 LW Lustre #0, 1, 2, 5.....(250 sheets) 1.98

**10x10" SWGL #1, 2, 4.....100 shots \$ 2.50
1,000 shots.....22.50

ENLARGING PAPER

4x5" SWGL #1 (200 sheets).....\$1.98
11x14" DWGL #1.....1,000 sheets 6.95
10x10" SWGL #1.....(100 sheets) 3.95
10x10 SWSM Varigam (100 shots) 3.50.....(250 shots) 6.95
9 1/4 x 20" SWSM #1, 3.....(50 sheets) 4.45

9" x 10" SWSM #1, 2.....\$8.95 2 for \$16.95

AWON FILMS

Please include postage with all your orders.
20% DISCOUNT on all new cameras, projectors, etc.
Before you buy—
Get our low price—
Write now!

*108-M West 29th Street, New York 1, N. Y.

AMON PHOTOGRAPHIC DISCOUNTS !!!

SUPER ANSCOCHROME-ASA 100

Fresh Orig. Anso Pack. Day or Tung—1959 date
35mm x 100' roll \$37.95
16mm x 100' roll 6.95

New! Anso Super Hypan Black & White Sheet Film
2 1/4 x 3 1/4 (box of 25 sheets) 3 for \$4.
4 x 5 (box of 25 sheets) 3 for \$9.

ENLARGING PAPER SPECIALS

4x5 SWSM #1 200 sheets \$1.95
9x5 "1000" SWSM 1, 2 \$8.95 ea. 2 for \$16.95

16mm KODACHROME original package
16mm x 200' roll Plus 16mm x 100' camera spools (Kodak processing included) \$11.
16mm x 100' Type A, 1957 date, proc. incl. \$6.50 3 for \$18.

CLEARANCE SPECIALS

Many below dealers cost! BRAND NEW! First come first served! ORDER NOW!
Westar 4.5 100mm lens for Practica etc. 17.95
35mm Super Panette, f2.8 lens, IF. 31.95
case (discontinued) 35.95
MINOLTA A 35mm, f3.5 lens, w/case 27.95
ANSCO Duaflex projector, 35mm & 2 1/4 in. 300 w. 35mm EXA reflex (disc) f2.9 stand lens, case 34.95
35mm VISTASCOPE wide screen lens 4.95
16mm VISTASCOPE wide screen lens 67.50
Mansfield Auto-Splitter, 8mm/16mm 9.75
SPOT-O-MATIC enlarging meter 34.95
Super Minolta A-2, 35mm, f2.8 w/case 35.95
Premier Prof. Titler-Mod #2 28.95
Premier M-2 accessory kit 8.50

TRIPOD SALE!

Quick Set Champ II, 3 Sect., Elev., List SALE
w/Pan Head \$33.00 \$32.95
Quick Set Husky II, 3 Sect., Elev., w/Pan Head 47.00 32.95
Star 5-18, 3 Sect., w/Pan Head 15.40 8.97
Star 5 Conquest, 3 Sect., Elev., w/Pan Head 21.50 13.30
Continental Mark III, 3 Sect., w/Pan Head 25.95 16.95
Over Tilt and Menopod 21.05 10.95
Quick Set Fairfax, 3 section, Elevator w/Pan Head 21.05 10.95

THIS MONTH'S SPECIALS

• 70mm x 100' Super XX or Infra Red film \$ 2.95
• 120 & 320 Kodachrome 3 for 3.00
• Telephoto Lens, 8mm, 1 1/4", f3.5 4.95
• Wide angle lens, 7mm, f3.2, F.F. 11.95
• Cardboard Stereo Mounts 100 for 26.50
• 1000 for 1.00
• Anso 35mm Cardboard Mounts 8.50
• Daylight BULK FILM LOADER & 3 cartridges 3.50
• ANSCO 120 All Weather Pan 12 for 3.00
• KODACHROME #28 (proc. incl.) 3 for 3.00

50% DISCOUNT off list—for 8mm movie SOLIGOR LENS SETS

7mm f2.5 FF w/a } list AWON
1 1/4" f2.5 F.M. Tele } \$6.90 PRICE \$28.45
1 1/4" f1.9 F.M. Tele } \$8.90 PRICE \$41.95

SLIDE FILE & TRAYS COMBO. SALE

• All metal slide case for 12 trays
• 12 trays in plastic covers for B&W, VIEWLEX, YDC, AO, KEYSTONE.

AWON SALE—all for only \$6.99

PORTABLE SLIDE FILE CASES

• For Tray & Magazine
• Fits Dots: KODAK: ARGUS: REVERE & AIRQUEST
Model 12 (12 Trays) \$4.95
Model 24 (24 Trays) \$7.95
12 Slide trays for Viewlex or YDC (hold 36 slides each) \$ 9.95
12 Airquest slide trays (hold 36 slides each) \$10.95

NEW EXPOSURE METERS

List SPEC
\$9.95—Alpen Direct Reading w/case \$5.95
Sekonic Leader Deluxe, Model 38, w/built-in boot cell and case 9.95
8.95—Sekonic Leader Deluxe, w/case 6.50
Booster Cell for Sekonic Leader 2.95
9.95—Sekonic Compact, w/case 5.95
DeJux 98 Meter w/case only 4.95
9.95—FR Meter w/booster & case 5.95
9.95—G.E. Mascot II 5.95
32.50—GE PR-3 w/case (discontinued) 18.95
Weston Master III w/case 21.95
Weston DR. Div. Reader Case for any of above 1.95

All equip. brand new. Prices subj. to change without notice.

EXCLUSIVE—RADIANT Portable Tripod Screens Crystal beaded 1958 Model

With new VYNA-SELECT fabric. These screens are fireproof, fungus proof, and washable. No other screen at these prices have all these higher-priced features.
SPEC. SPEC.
80 x 40 \$8.95 37 x 50 \$15.95
40 x 40 9.95 30 x 50 14.95
Radiant zipper case for any above—\$3.95
50" Screens are shipped N.R. Expr. collect postage

Closeout on Brand New FEDERAL Enlargers

List SPECIAL
35mm 135C, f4.5 lens \$54.95 \$39.95
Model 135C, Carrying case 9.95 6.95
FOR 2 1/4 x 3 1/4 NEGATIVES
No. 240, Diffused, f7.9 \$29.95 \$20.95
No. 250 Diffused, f6.3 34.95
lens \$43.95 28.95
No. 295, Sgl. Cond. f6.3 34.95
Carrying case for 290 or 295 9.95 6.95
No. 299CL Cold Light f6.3 307.95 37.95
No. 311 Sgl. Cond. F4.5 375.95 47.95
FOR 4x5 NEGATIVES
No. 450, Diffused, f4.5 \$110.95 79.95
FREE—This Month only—with any enlarger, 200 sheets 4x5 enlarging paper—FREE.

Brand New! FER Latest Model ELECTRONIC FLASH

• Needs only 4 small batteries
• Hand-Grip head for "off-the-camera" shots
• Switches easily to AC power
• Constant flash value and exposure
• Comes with camera bracket, and AC line cord.
List Price . \$54.50 AWON SPECIAL . \$29.95

ELECTRONIC FLASH OUTFITS

BRAND NEW List PRICE
Utilibralt Jet, A.C. or Batt. \$69.95 \$44.95
Utilibralt Comet w/nickel cadmium battery 49.95 34.95
Richlite A.C. & Batt. 54.95 34.95
Hershey "700" A.C. or Batt. 24.95 19.95
Ri Dynalite A.C. 32.50 26.95
PR Model II, A.C. or Batt. \$4.50 32.95
PR Model 140, A.C. 29.95 21.95
And your old flashgun in trade

Brand New! HILAND Electronic Flash

JUST OUT. Eliminates separate battery case. AC or batt. Model 64-A list \$49.95—AWON \$36.95
Model 64-B (transistor) list \$9.95—AWON 43.95

SPECIAL SALE—ALL METAL REEL CHESTS, REEL & CANS

CHEST 183—Holds 12 300' 8mm reels and cans \$2.49
CHEST 183—Holds 12 300' or 400' 8mm film & cans 2.79
CHEST 184—Holds 12 400' 16mm reels and cans 3.69
8mm 300 ft. REEL & CAN 4 sets for 2.49
8mm 400 ft. REEL & CAN 4 sets for 2.95
8mm 400 ft. REEL & CAN 4 sets for 3.65
16mm 400 ft. REEL & CAN 4 sets for 3.65

ARGUS Sale! ALL BRAND NEW discontinued MODELS

SPECIAL AWON COMBINATION DISCOUNT!
ARGUS C-3 w/case, flash & reg. lens plus SOLIGAR 135 mm f4.5 telephoto lens BOTH for only—\$64.95

ORIG. AWON LIST PRICE
ARGUS C-3 w/case & flash (discontinued) \$69.95 \$41.95
ARGUS C-4 w/case & flash 99.50 56.95
ARGUS C-44 w/case & flash 117.00 79.95
ARGUS 75 outfit 23.95 19.95
SLIDE PROJECTOR
ARGUS 300 watt. BC 39.50 29.50
ARGUS 300 watt w/ Auto Changer & case 82.50 42.95
ARGUS 500 wt w/ auto changer & case 79.50 38.95

Special for ARGUS fans

SOLIGAR top quality 135mm f4.5 telephoto for Argus C-3. List Price 49.50—SPECIAL—\$29.95
SOLIGAR 35mm f3.5 wide angle lens for Argus C-3—SPECIAL—\$29.95
Auxiliary telephoto for C-3, w/case ONLY \$7.95
AIRQUEST alk trays for Argus projector 6 for \$8.95 12 for \$16.95

BRAND NEW! PENTA-PRISM

Split image Rangefinder comb. w/prismatic viewfinder. For Exakta V, Vx and Exa. Complete with case & extra ground glass
AWON SPECIAL—only \$21.95

SAVE BY MAIL !!

All Equipment BRAND NEW. Order Now!

DARKROOM ACCESSORIES BRAND NEW

List Sale
Yankee Lordomat 30 Tank 10.95 7.28
Yankee 4x5 Utility Tank 2.95 2.10
Yankee 4x5 Apitank cut film 9.95 6.95
Yankee Safe lite w/3 Filters 4.95 3.89
Airquest 4 Way Fixed Easel 9.07 6.95
Airquest Dialmaster Easel 14x17 17.06 12.89
Airquest Photostat 4x5 Printer 14.34 9.95
Brumberger 8x10 Metal Printer 22.00 14.95
Brumberger 8x10 Paper Safe 10.95 8.49
Brumberger 11x14 Paper Safe 19.95 15.95
Fedco Focus Rite Enlarging Aid 2.25 1.78
Fedco No. 100 Dryer 11x14 9.95 6.75
Gra Lab #168 Luminous Timer 24.95 17.20
Premier A2 Roto Dryer 24x28 49.95 33.89
Premier A1 Roto Dryer 12x20 27.50 18.95
Spotmaster 1" Brush 4.95 3.50
Spot-O-Matic Enlarging Meter 15.00 10.97
Kodak Timer Minutes & Seconds 8.95
Kodak 35mm Day Load Tank 34.00 24.95
Norse 63 35 & 16mm Day Tank 6.75 4.95
Precision 11x14 Metal Adj. Easel 34.00 24.95
Carroll Film Hanger 4x5 89.50 68.89
Pelouze Darkroom Scale 8.95 6.75
Nikor 35mm Tank single reel 9.93 7.45
Nikor 120-620 Tank w/reel 9.93 7.45
Nikor 36 exp. 35mm wide space reel, or 620, 120, 127 4.95 3.95
Nikor 33 tank w/2 35mm reels 12.95 10.75

PHOTO MOUNTS

Attractive cardboard folder for photo presentation.
4x 5 50 for \$ 4.50—100 for \$ 8.
8x 7 50 for \$ 5.50—100 for \$ 10.
8x10 50 for 10.00—100 for 18.

YASHICA REFLEX CAMERAS

ALL BRAND NEW—LATEST MODELS—PRICE INCLUDES LEATHER CASE W/STILL CAMERAS
List PRICE
YASHICA A \$35.95 \$23.25
YASHICA C, semi automatic 54.50 38.95
YASHICA L.M. semi automatic with built-in exposure meter 69.95 44.95
YASHICA MAT AUTOMATIC 85.50 58.95
YASHICA 44 (127 film baby reflex) 69.95 48.95
Nikor 35 635 dual 35 cc. & 35mm 44.95 32.95
YASHICA 8mm movie 385, f1.9 lens 49.95 33.95
YASHICA 8mm movie 587, f1.4 lens 79.95 52.95

KODACHROME PROCESSING

35mm x 20 exp., mfg. \$1.00
35mm x 36 exp. mfg. 1.00
8mm x 25 ft. dble. 1.00
8mm x 1 ft. mag 1.00
16mm x 80 ft. mag 1.00
16mm x 100 ft. roll 2.50
All film returned via insured mail.
Check or Money Order must accompany film.

AWON DOES IT AGAIN!! WOLLENSAK Sale!

All BRAND NEW! All in factory sealed cartons! Superb equipment and values at bargain prices

MOVIE CAMERAS List AWON PRICE
8mm Model #42, f1.8 F.F. \$ 99.50 \$ 70.75
8mm #42, turret 3 lens f1.8 99.50 72.50
8mm #42, f1.9 focusing turret 85.50 66.95
8mm #53, 3 lens turret 199.90 148.00
8mm #28 magazine, f1.9 foc. 139.50 101.65
8mm #27, mag., 3 lens turret 149.50 108.95
16mm #91 magazine, f1.9 foc. 187.50 136.95
16mm #91, mag., 3 lens turret 257.50 209.95

PROJECTORS
8mm #715, 500 wt, 3 reels, built-in splice & case 162.50 118.65
8mm #715, 750 wt, w/case 189.50 148.00
16mm #65, 750 wt, w/case 199.90 148.00
2 1/2" 8" Automatic SLIDE projector 35mm and Super-slides, 500 wt; #818 149.90 108.75

TAPE RECORDERS
#1300, dual speed, w/case 189.50 127.95
#1515, Dual Speed Stereo 154.95

4-LITE FOLDING MOVIE BAR LIGHT

With metal carry case, 2 toggle switches and 7' heavy duty cord. AWON SALE \$7.50
Bulbs remain on bar in case. \$1 ea. with purchase of bar.

NEW, COMPACT MOVIE LIGHT BAR

4-Lite mov. bar, with metal case and four bulbs—NEW! MORE COMPACT design—AWON SALE \$10.82 w/4 bulbs without bulbs \$7.75

Mansfield "Holiday" brand new 8mm MOVIE PROJECTOR

• AWON SPECIAL • All die cast aluminum • 500 watt • Blower cooled • ctd. f1.8 lens • 400' reel capacity
AWON DISCOUNT PRICE—only \$36.95
Luggage type case—only \$4.95

EDITING EQUIPMENT

List SALE
Mansfield 8mm Action Editor \$39.95 \$17.95
Mansfield Deluxe 8mm Portable, w/case 49.95 24.95
Kalart 8mm Action Editor 39.95 24.95
Craig 8mm or 16mm Portable w/case 79.50 49.95
All Editors Include Rewind, Splice & Baseboard
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HOW TO USE LENSES

(Continued from page 166)

their lenses as mighty poor pieces of glass when the actual culprit is simply the lens-camera alignment.

Much more can and will be written about interchangeable lenses. Recently, we put a long lens on a camera and looked around our home. Here was a delicate still life of an orange in a bowl, caught ever so sharply within the confines of the narrow angle of view. There was a wild brilliant pattern made by ribbons on a table. Small, often overlooked items took on new importance. Lenses are meant to be used like this, and few ever get tired of looking through the viewfinder.—H.K. and M.M.

Editor's note: We'd like to thank the Standard Camera Corp., Sterling-Howard Corp., Voss Photo Corp., and Zoomar, Inc., for lending MODERN the many lenses necessary for this story.

A LAST PICTURE

Those who love and make their living from photography aren't necessarily photographers. Some write about it.

A friend of ours, George Wright, edited *American Photography Magazine*, later switched over to managing editor of *American Photographic Book Publishing Company*. Here he planned and edited *Available Light* and laid the groundwork for a raft of photo books, before he decided to strike out on his own. Along the line, MODERN lost a very capable editor and George Wright gained a wife, Cora. Working as a husband and wife team for the past two years, they were responsible for a wide range of books—*The Nikon Manual*, *Mounting, Projecting and Storing Slides* and a number yet to be published. Together they edited the journal for the New York Chapter of the Society of Photographic Scientists and Engineers. George wrote a column on making money in photography for *Popular Photography*, contributed articles to other magazines and journals.

The Wright household became a gathering place where those interested in photography seemed to gravitate. And George was always ready to interrupt work and, over coffee and tons of ice cream, look at pictures, listen to photographers' problems, make suggestions.

Unfortunately, last August, somewhere along the line a bit of human machinery failed. We all feel a great loss, of course, but we're most sorry for those of you who won't have the opportunity of reading more from a man who knew photography and loved it.

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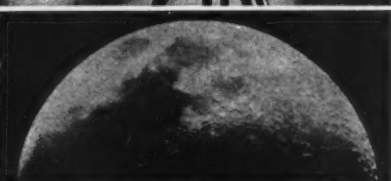
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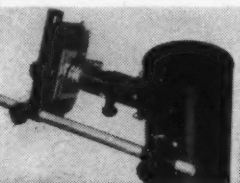


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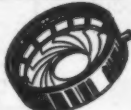


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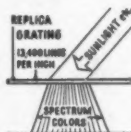
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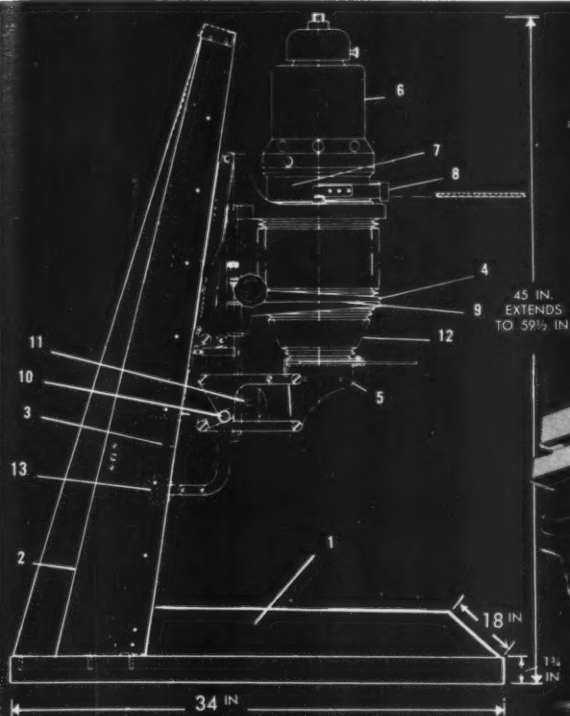
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